FROM THE BROADCAST REFLECTOR, COURTESY OF BARRY MISHKIND AT HIS FASCINATING SITE WWW.OLDRADIO.COM. ***This is further discussion of the regulatory impact of international AM treaties and some good detail on how some am stations tried to upgrade their facilities. This "thread" ties to two other documents also on this site, on "RIO/NARBA" agreements.***

This reads as a stream of consciousness; the comments are not always connected and detail can be repetitive, but it's actually composed of input from several contributors to the reflector and you will learn a lot about individual station-upgrade plans. In the true spirit of a "wiki" some of this information may be factually-deprived and some call-letters have changed since these postings first appeared. This does however make interesting reading, beginning with an answer to a question about changes on 1500, 1130 and other channels:

WTOP and KSTP modified their patterns about ten years ago under an STA. This resulted in a slight increase in suburban service in DC, but also resulted in considerable mutual interference. About half of WTOP's interference-free night service area was lost by this change, particularly as WTOP is a coastal station. Some, but not much of KSTP's interference-free night service area was lost by this change. These mutually agreed to STAs resulted in a considerable increase in "interference" to WLQV, for which WLQV sought relief. It took ten years and many designs, but WLQV was finally granted compensation in the form of a night power increase from 3 kW into 9 towers (its former operation was 5 kW into 12 towers, but the east-most three towers were lost to a K-Mart shopping lot, thereby resulting in a reduction to 3 kW) to 5 kW into 9 towers. As part of this settlement, KSTP agreed to a slight increase in interference to it (by WLQV) in the upper Michigan peninsula. Ultimately, and at the last minute, 10 kW into 9 towers was granted to WLQV. And, all this from an otherwise minor pattern change at WTOP. There was really no pattern change, per se, at KSTP, just a clarification of certain pattern parameters.

Interesting history of 1500 (and 1490) in the L.A. area ...KWIZ, Orange, was 1500 under another call back when 1500 was a de-facto Class IV frequency. Moved to 1490 under NARBA. KWIZ applied for 1480 with 1 kW DA-N. Granted. KBLA, Burbank, applied for 1490 under a different call. Granted. KWIZ applied for 5 kW-D, 1 kW-N, DA-2, apparently protecting KBLA (perhaps KTYM as well). Granted.

KBLA applied for change to 1500 with 10 kW DA-2. Night wouldn't proof, so 10 kW-D, 1 kW-N, DA-2 was granted. KBLA under a different call went dark. KWIZ applied for 5 kW DA-2 under a different call. Granted. Pre-NARBA, WDGY was assigned to 1180, and it shared that frequency with WMAZ, Macon, GA, KOB, new College, NM, WGBS, New York City, and KEX, Portland, OR.

Post-NARBA, WMAZ was moved to 940 as a Class II-B, WDGY was moved to 1130 as a Class II-B, KOB was moved to Albuquerque and to 770, which would ultimately be determined to be Class II-A after several decades of law suits. WGBS was moved to 1130 as a Class I-B (initially with CKWX, Vancouver, BC, and later with KWKH, Shreveport, LA, both of which were also Class I-Bs), and KEX was moved to 1190 as a Class I-B (KEX was then co-owned with Westinghouse, which was the "historical" owner of 1190, through a succession of frequency changes). So, now we have WDGY on 1130 as a Class II-B, sharing that frequency with WBBR, CKWX and KWKH, these three being Class I-Bs.

Days, KFAN has a predominant pattern equivalent power of 10 kW, reflecting a maximum permissible day power of 10 kW if operated non-directionally; yet the licensed day power is 50 kW; that power has to go somewhere in order to maintain an average maximum of 10 kW towards the three Class I-Bs, days, so that extra power is directed towards Minneapolis, the COL, with a local maximum effective power of over 400 kW; since there are no Class I-Bs towards the south, the maximum effective power towards the south is about 20 kW, days, 2)

Nights, KFAN has a predominant pattern equivalent power of 0.1 kW (one-hundred watts), reflecting a very low maximum permissible night power towards the three Class I-Bs [*] which totally enclose KFAN's geographic location; the licensed night power is 25 kW; that power has to go somewhere in order to maintain an average maximum of 0.1 kW towards the three Class I-Bs, so that extra power is directed towards Minneapolis, the COL, with a local maximum effective power of nearly 250 kW.
[*] Class II-Bs must have a minimum power of 0.25 kW (two-hundred-and-fifty watts) and operation with 0.25 kW non-directionally would likely be technically impossible for WDGY, so a DA of some kind was obviously going to be required.

Strange that a Class I-B would elect to install 155.00 degree towers with 35.00 degrees of top loading to bring these towers up to 190.00 degrees. 155 degrees on 1540 is about 275 feet, whereas the a 180 degree tower, which would be more than compliant, would be only about 45 feet taller, or barely more than two tower sections more.

Storer's 1490 to 1500 conversion in Detroit (now as WLQV with 9 towers and 10 kW nights, but formerly with 12 towers and 5 kW nights) may have beat KLIF's 12 towers by a few years, I think.
KRLA, as KPAS/KXLA, was pretty conventional ... four 135 degree towers. Very strong towers.

Along came Jack Kent Cooke's brother (using foreign money from Jack, who was not then a U.S. citizen) and he bought the station and converted it to the KRLA we all came to know and love.

The two end 135 degree towers came down and were re-erected to the south of the two inner 135 degree towers, thereby making a parallelogram. 50 kW went into those four towers. The N-S set of towers protected 1090 and 1130 in San Diego/Rosarito Beach. The E-W set of towers (which were also towers 2 and 3 of the night array) protected KFAB to about the critical hours level. The result of all this was a pattern which favored communities to the northwest of the Whittier Narrows site, and those would include L.A., W.L.A., the San Fernando Valley and the many beach communities.

At the demand of KFAB, the west-most 135 degree tower was replaced with a new 90 degree tower and the east-most 135 degree tower was replaced with a new 180 degree tower. These towers were about one-half the cross-section of the original towers.

The KFAB demand was that this new night array, with 90-135-135-180 degree towers, would provide zero radiation at vertical angles towards KFAB. Apparently this design was not successful, but it remained in place until KRLA moved to its present site. The present KRLA site) more-or-less duplicates the original KPAS/KXLA four 135 degree tower night array, but with 20 kW instead of the original 10 kW.

Days, KRLA presently uses two widely spaced towers with a minimum towards San Diego, a pair of nulls over the San Gabriel Mountains (perhaps one of those towards KFAB), and maximums towards populated communities in the greater L.A. area.

KXA changed its day and night facilities a few years ago, electing to operate DA-2 using two towers days and three towers nights. KXA previously operated DA-N with two towers. KXA's new night pattern is asymmetric and has significant radiation towards co-channel Class A WLAC, Nashville. The previous night pattern had nearly zero radiation towards WLAC. Undoubtedly, these changes are the reason KOMA is now more difficult to receive in Boise.

WLAC also operates with an asymmetric pattern, nights, but that's because WLAC must protect the "historical" 5 kW night operation of Class B WMEX, Boston.

Both KGA and KKSN are the same class "B". Under the old FCC class system KGA was a 1B. KKSN (ex KYXI) was a class II. If so the database is wrong. KGA is an ex-Class I-B, now class A. KKSN is an ex Class II-B, now Class B. The array was not designed to be broadband. And 225 degrees is a bit too tall. They have serious skywave fading at 20 miles from the transmitter, right in the middle of a population 1510 is trying to serve. Hatfield & Dawson verified that the tall tower is the cause.

225 degrees might be OK for a Class C which is trying to get the max out of its 1 kW (probably reduced to 0.5 kW with a tower that tall), but a Class A should never use a single section tower taller than 200 degrees. A 300 degree two-section tower which is anti-fading is OK, a Class A station in the 1500s should seriously consider a Franklin, which is 360 degrees tall and is about 510 mV/m/kW at 1 km. 225 degrees is about 440 mV/m/kW at 1 km, but the fading problem is severe for a Class A.

Somebody asked how a legacy station like WHP could wind up needing a six-tower array at night. Here's what I know: I'm not sure just when WHP moved from 1460 to 580. I suspect that the move took place in the late 50s or early 60s. After WHP moved, there was fierce competition for the 1460 frequency. The first occupant after WHP was WCMB, which had been a daytimer licensed to Lemoyne PA (possibly on 960). If I'm right that WCMB came to 1460 from 960, that move made way for WHYL. I believe that immediately before its move to 580, WHP ran 5 kW-D/1 kW-N DA-N using two towers at night. I suspect (but do not know) that when WCMB moved to 1460, it took over WHPs old Tx, which was located east of Harrisburg on the road to Hershey. After the move, WCMB, like WHP, was licensed to Harrisburg.

On 580, WHP has always run 5 kW DA-N using six towers at night. The complex night array was necessitated by co-channel stations in Worcester MA (WTAG), Toronto (CKEY--used to be on 580 but since moved to 590, changed Tx sites, increased power to 50 kW DA-1 9 towers, and changed calls several times—now CJCL), and Charleston WV (WCHS?). There was (is?) also an AM 580 in Ottawa ON and there was another (now dark) in Nova Scotia (name of the town escapes me). Because those stations are northeast, north, northwest, and southwest of Harrisburg, the only way WHP could get a full 5 kW at night was to locate northwest of Harrisburg and directionalize to the southeast at night using a very narrow pattern.

As you know, 5 kW on 580 covers better than 100 kW on 1460, so the move helped WHP's daytime coverage enormously. And as someone has already pointed out, WHP's night pattern was--and apparently still is--quite favorable for coverage of the market. Moreover, I suspect that 580 was and is a lot quieter at night than 1460 is, so, despite the complex pattern, WHP probably also gained significant night coverage because of the lower QRM as well as the lower frequency... so, despite the complex pattern, WHP probably also gained significant night coverage because of the lower QRM as well as the lower frequency. Also, the station gained night service to cities SE of Harrisburg, such as Philadelphia.

The night array's major axis is 26.0 degrees, so the figure-8's maxima are at 116.0 and 296.0 degrees. The backside is canceled to a significant degree; therefore the pattern maximum is at about 116.0 degrees. Harrisburg is located 4 miles distant on a 117.6 degree bearing from the transmitter site. Philadelphia is located 98 miles distant on a 101.4 degree bearing. I'm not sure just when WHP moved from 1460 to 580.

11/13/38: Power increased to 5/1 kW, DA-N.
3/29/41: Moved to 1460 kHz.
5/21/51: Moved to 580 kHz at 5 kW, DA-N.

The FCC microfiche records do show that WCMB began on 960khz with 1kw-D. Their first license was granted 3/19/48. They were granted a C.P. for 1460khz 5kw, DA-2, on 10/4/51.

One of those things that's kicked around in my head for years, and it's a question I've never been able to get an answer to: a long time ago, when all of the US stations on 1050 were required to go off the air at sunset to protect a Mexican clear (XEG in Monterrey) there was one station in New York City that didn't-WHN. I know there was a "gentlemen's agreement" between Mexico and the US, but don't know how that came to be. Is anyone able to shed some light on this?

That "gentleman's agreement" was the 1939 North American Regional Broadcast Agreement, which went into effect in 1941. 1050 was a United States de-facto Class I-A clear channel, assigned to KNX in Los Angeles. In order to meet Mexico's demands for more Class I-A clear channels, KNX vacated 1050, and 1050 was assigned by NARBA to Mexico. KNX would have been moved to 1080, anyway, by NARBA's "table method" of channel shifting.

However, as KNX was assigned to 1070 instead, 1080 became available to solve the shared-time arrangement of several other stations, thereby creating several non-time-shared Class I-B in-fact stations (KRLD, Dallas, and WTIC, Hartford). Several other time-sharing arrangements were also resolved, but on other frequencies (WBAL, e.g.). Mexico also wanted unlimited time operations on several other U.S. Class I-A in-fact channels, but at low power.

In order to accommodate Mexico, Mexico was assigned unlimited time priority on 830 and 1030, but limited to 5 kW, non-directional, from Mexico City. In return for this, the United States received compensation in the form of unlimited time priorities on four Mexican Class I-A in-fact channels: 800, 900, 1050 and 1220. 800 and 900 were assigned to Alaska, and were limited to 5 kW, non-directional (same as Mexico's use of 830 and 1030). 1050 was assigned to New York City, and was limited to 50 kW DA-1, with the required pattern protecting the entire Mexican border, all hours.

1220 was assigned to Cleveland, and was also limited to 50 kW DA-1, with the required pattern also protecting the entire Mexican border, all hours. It is no accident that Philadelphia's 1060 protects New York's 1050, and vice versa. Without this mutual protection, KYW wouldn't have the requisite interference-free service area to retain its Class I-B status (1060 was earlier moved to Philadelphia from Chicago, but I believe it operated with 10 kW, non-directional, until the channel shift took effect, after which time it operated with 50 kW DA-1).

Has 1070 kc always been a clear and who in the east are TN stations like WDIA and WFLI protecting at night? Does anyone know? I have often wondered who they are protecting at night.

1070 was always a clear. WDIA and WFLI both protect the co-channel Class As, as all Class Bs are required to do, plus, primarily, WAPI, Birmingham, AL, and, secondarily, several others. WAPI didn't start out on 1070, or even on 1070's pre-NARBA frequency, but WAPI was there first (in the southeast and on 1070), and under the "demand allocation" doctrine it therefore has priority. WAPI protects only the Class As in Los Angeles and Moncton. WAPI operates with 50 kW days, non-directional, and with 5 kW nights, directional into two towers. An application for 10 kW nights was not constructed.

Peter, what did CBK used to have in the old days? I don't know what the Regina operation was, but the NARBA treaty documents (at least those which were available in the 1950s) list the efficiency of each Class I station, including CBK, and from that efficiency one could surely estimate the radiator's height. The (relocated) Watrous operation is the stated 96 degrees. That signal was awe inspiring, but has not been so in the last 15-20 years.

I'm sure it was, but that signal was compromised by the US-Mexican Treaty in the mid-1950s, which gave Mexico a Class I-A priority on 540, even though Canada, via NARBA, already had a Class I-A priority on that frequency. Mexico built a 150 kW station, XEWA, that was notified for 432 mV/m/kW at 1 km, but was clearly only about 360 mV/m/kW at 1 km.

That agreement resulted in: 1) the destruction of CBK's secondary service area, and 3) the mandated elimination of US stations outside the "650 mile limit" (of the US-Canadian border), but within the secondary service area of XEWA. The loss was essentially limited to KFMB, which received identical facilities (5 kW DA-N) on 760 as compensation. KFMB is now 5 kW ND-D, 50 kW DA-N, limited to 5 kW days by the presence of 740 in Avalon. Incredibly, KNOE was allowed to retain night service on 540, but WGTO, which was more than a thousand miles more distant from San Luis Potosi (XEWA) than was KNOE was not permitted to add night operation until decades later.

I heard that they had had a really tall tower that fell over. I know that we used to be able to hear them in Wisconsin on ground wave when I was a kid. And the way they used to identify was so neat: CBK, Saskatchewan. They probably had 25 mv/m over the entire province! CBK's secondary service area also included half of Washington, a quarter of Oregon, all of Montana, Wyoming, North and South Dakota, two-thirds of Nebraska, seven-eighths of Minnesota, and a quarter of Iowa and Colorado.

WNEW's case: They had significant protections to the South and West, (Detroit MI and Shreveport LA) ... KWKH, Shreveport, LA, and CKWX, Vancouver, BC, Canada.

The 1130s in Detroit and Minneapolis were moved to that frequency from 940, I believe, and the 1130 in Milwaukee was the result of Hearst wanting to have the first (then it was the only) 50 kW station in Wisconsin, by moving WISN from 1150 to 1130 [*] . All these 1130s are ex-Class II-Bs. WNEW is itself a relatively new ex-Class I-B, being moved there from 1100, I believe, in 1941.

RE: High Island New York diplexed tower: ... I'm sure CBS and NBC at the time had a reason for their decision. I suppose the height of the tower is more optimal for one or the other, and the lower frequency 660 vs. 880 ...? 880 is the owner, 660 is the tenant. The tower was originally sectionalized, IIRC, and now as a conventional (i.e., non-sectional), but top-loaded radiator, it is near optimum for 880, at about 206 degrees. It is acceptable for 660 mainly because of the salt water ground.

[*] Had Hearst maintained WISN on 1150, and waited the 30 or so years for the "Rio" merging of Class IIs and Class IIIs into Class Bs, it could have converted WISN to 50 kW DA-2 on 1150 with far fewer towers and with far better coverage than it required, and obtained, on 1130 with only 50 kW days and 10 kW nights. IIRC, the conversion of WISN from Class III-A to Class II-B was done in 1965.

The 1130s in Detroit and Minneapolis were moved to that frequency from 940, I believe...

Neither of the stations was on 940kc. 1130 Detroit was first licensed on 1/12/40 as WCAR on 1100kcs with 1kw-D. On 7/26/50 they were granted a C.P. for 1130khz, 50kw-D, 10kw-N, DA-2. After a lot of delay due to CAA/FAA issues, they were granted a license on 11/25/57. 1130 Minneapolis, WDGY in 1982, was on a number of frequencies since its beginning in 1923. They were on 1140, 1150, 1050, 1410, 1390, 560, and then back to 1180kc. On 8/14/40, they were granted 1100kc, 10kw-D, 5kw DA-N, unlimited. NARBA moved them to 1130kcs. On 2/27/48, they were granted 1130kc, 50kw-D, 25kw-N, DA-2. WNEW is itself a relatively new ex-Class I-B, being moved there from 1100, I believe, in 1941.

Occupants of 1180 were moved to various frequencies, including 1130 and 940.

Right. I got that bas-ackwards. That cleared 1180 for WHAM.

Yes, as the result of moving what was WPG on 1100 in Atlantic City, NJ to New York and re-designating it as WOV. The call letters changed to WNEW on 11/12/41.

Somehow, with the rebuilds of the WOR array and the WCBS/WNBC tower, all three stations seem weaker in the South Jersey, Baltimore/Washington area. Perhaps it's the addition of other stations or the rise of the AM noise floor, but my tapes of the stations made in the 1960's and 70's were clearer than reception today.

As for 1010, the station has been trying for decades to increase power ...James Gabbert (then the owner of 1050) reportedly tried to do a 1050/1010 swap, but it fell through.

I believe this was during that "blackout" period when U.S. Class Bs on Mexican clears (including 1050) were limited to 1 kW nights (these were formerly limited to 1 kW days, and to days only). Gabbert had already bumped 1050 up to 50 kW-D, 1 kW-N from two sites. Then he applied for 50 kW nights, even though he knew that application would be rejected. Then he got 50 kW-D, 10 kW-N, DA-2 from the day site, and the night site in San Mateo was deleted.

Finally, he bought and took dark KPAY/1060 in Chico, and modified the day array for better coverage of the North Bay. 1050 is still 50/10, and with yet another 10 kW night pattern. 1010 is still stumbling along on low power.

Somebody asked which stations these belong to. I think they are 960, 1010, and 1310. The first is licensed to Oakland; the third--and also the second, I believe--are in SF. Given the need to protect stations inland and the great conductivity of the Bay, you won't find a better spot for AMs in any major market anywhere. 960 and 1310 are legacy signals and both are DA-1. I suspect that 5 kW gets them a nighttime interference-free signal in SF, Oakland, and San Jose, not to mention Silicon Valley. As for 1010, the station has been trying for decades to increase power. According to my source (Bob Carpenter's AMSTNS, which uses info from the FCC's public AM database), 1010 is licensed for 10 kW-D/500W-N, holds a CP for 10 kW-D/1.5 kW-N, and has applied for 35 kW-D/15 kW-N all from what appears to be the same three-tower array. If anyone a tad closer (which would be just about everyone, because I'm in Boston) has better information, let's hear it.

910, 960 and 1310 are Oakland. All are ex-Class III-As, but of these only 910 operates ND-D. 1010 is S.F., and is a resurrection of KQW's old frequency after it had been abandoned with the move to 740 and to the present Novato site of KCBS. Used to be Class II-D; is Class B now.

The Kansas City 1190 immediately applied for a nearly 20 times increase in night power when WOWO applied for 9.8 kW nights (thereby making WOWO a Class B as soon as the reduction, from 50 kW, was approved). The Dallas 1190 apparently did nothing at that time, and so it may be stuck with its present night pattern. Dallas (and Kansas City) still have to worry about two other Class As, KEX and the one on Guadalajara, Mex. Now, Guadalajara is "grandfathered" at 10 kW nights, but KEX has recently opened up its pattern (towards former Class A WOWO).

Before the WOWO decimation, WOWO was the limiting factor to any development of 1190 in the Southwest (Dallas), Midwest (Kansas City) and South (Atlanta).

It took Dallas five towers in-line to protect WOWO, when licensed at 1 kW, and twelve towers in a six by two to protect WOWO, when licensed at 5 kW.

I think a number of stations now happy with their night allocation on 1570 would be very upset if XERF were to get a modern 250 KW rig and come up at full power.

Not likely. "The Big X" is presently operating at 10 kW.

1020 in Roswell comes to mind. Any potential that 1020 had was completely destroyed when Storer (the immediate predecessor of David's 1020's owner) destroyed Roswell's very nice pattern so that KGBS could obtain 24 hour operation. Same comment for 1100 in about the same time frame. Same comment for 670, in the current time frame. Same comment for 1210 in the immediate future.

KENR/1070 in Houston has an 11 tower array, which consists of the original nine 200 degree towers (10 kW-D, 5 kW-N, officially "DA-2", but actually DA-1) and two additional 90 degree towers added much later, and intended to retain protection of the Alice, TX 1070, but send more day radiation towards the northern 'burbs (now 10 kW-D, 5 kW-N, DA-2, for real). This array has the most steel in the air of any known array, not even counting the two added 90 degree towers.

Storer's 1500 Detroit actually started out as a Class IV on 1490. The 1490 frequency was traded with a 1500 daytimer located some distance from St. Paul, thereby giving Storer the start of its journey from 0.25 kW ND-U (1490) to 50 kW-D, 5 kW-N, DA-2 with 9 towers days and 12 towers nights (1500).
(It is said that Storer, a Toledo native, wanted to hear his "50,000 watt Mo-Town blowtorch" in Toledo, so the pattern intentionally had a little spur which, occasionally, reached him in Toledo). Strange that another 1490/1500 situation also existed in yet another Storer market, Los Angeles.

What would become KBLA on 1500 started its journey on 1490 with 1 kW-D, 0.25 kW, ND-U in Burbank. But, before that, what would eventually become KWIZ (Orange) was on 1500, then a Class IV frequency. With NARBA came the exchange of 1500 for 1490, while WTOP and KSTP (where have we heard of these before ?) moved from 1460 to 1500 by the "table method". So, now we have the KWIZ, to be, on 1490, but it wanted more than 0.25 kW, so it applied for, and was granted 1480, first with 1 kW DA-N (two towers) then 5 kW-D, 1 kW-N, DA-2 (two towers days, two towers nights, three towers on the site). That move to 1480 made an opening, many years later, for the KBLA, to be, on 1490 with 0.25 kW, later to be upgraded to 1 kW-D, 0.25 kW-N, ND-U, with the antenna in a city park.

Some time later, a perhaps George Storer wannabe, one George Cameron, bought the station and moved it from 1490 to 1500, with a CP for 10 kW DA-2 and six towers up on top of the Verdugo Hills, high above Burbank. Cheap real estate up there. But, you ALWAYS get what you pay for.
Apparently, no one apparently told this George that AM doesn't like its towers a thousand feet or so above the COL, and every other populated place in the region. The night DA wouldn't proof, so KBLA was finally licensed as 10 kW-D, 1 kW-N, DA-2.

While George Storer moved on to cable TV (L.A.'s KGBS had already become the 50 kW DA-2 unlimited time KTNQ ... "Ten Q" ... although the lettering on the Tx shack still said KGBS ... and was subsequently sold to a Spanish language group, but remained KTNQ ... now "Super Q"), that other George, George Cameron, went under, but not before trying KBBQ and, later, KROQ on 1500, and lastly, KROQ-FM, that being licensed to Pasadena.

The 10 kW DA-2 1540 station was on borrowed time, and Westinghouse was paying some of its bills while keeping the station dark for a planned upgrade to its new (to it) 10 kW DA-2 1550 station in S.F. Then Westinghouse reneged on the payments, and the 1540 station promptly filed for bankruptcy. Westinghouse had great plans for 1550 ... move the Tx from Belmont to San Jose, install 200 degree sticks, pump up the power to 50 kW DA-2. Which is why it needed the 1540 station to be dark. But, San Jose wouldn't grant the required permits, and 1550 is still with its fifty-year-old facilities in Belmont, and still with "five wire" line, too. The 1540 station is "deleted domestically, but retained internationally".

The funny thing is 10 kW DA-2, or even 50 kW -D, 10 kW-N, DA-2 was feasible on 1500 in the L.A. market, just not from Burbank, and definitely not from a site high in the Verdugo Hills.

O. Wayne Rollins (DBA Rollins Broadcasting) successfully installed a 50 kW DA-2 in L.A., an upgrade from, first 10 kW DA-D, and, later, 50 kW DA-D. A new hill-top site for Rollins' KDAY, though (Alvarado and Effie Streets in L.A.) ... NOT a MOUNTAIN-top site, as in KBLA's case. Funny thing is ... KDAY (1580) would later become KBLA.

Bob Gowa wrote that the 1500 array was last used in the 1980s, but that the atomic bomb-proof "bunker" is still there, as are the six towers. I recall that 1500 (10 kW-D, 1 kW-N, DA-2) was more difficult to receive at my Brentwood residence than was Burbank's 1490 ... KBLA's lineal predecessor.

The L.A. market had 1500, 1540 and 1580 (1540 being the last new AM to be allocated with an L.A. COL, in about 1955) with first and second adjacents being all over the place ... 1480, 1490, 1510, 1520, 1550, 1560, 1570, 1590 and 1600. So tell us, Peter...IS 1500 on the air out there...and if so, with what facilities?

Royce International bought 1500. I don't know if Royce ever operated it from "the bunker" as the Txs were likely gone, and none are there now. Royce tried three times to put it on the air: 1) 50 kW-D, 14 kW-N, from a site in the far northern part of the City of Los Angeles, Tujunga Wash to be precise; I lived near there, in Tujunga, proper, a district within L.A., from 1947 to 1949; the site is actually in the watershed of the L.A. River, and, hence, was always an environmentally protected site, so there was absolutely no possibility of this array ever being built; 2a) diplexing with 710 by adding another tower to 710's site, and using two of 710's three towers; this came to nothing; 2b) diplexing with another station, 1110, would have worked, but 570 (KLAC), first, and, later, 870 (then as KIEV) wanted to diplex with 1110 (this would have given 1500, if co-located with 1110, 182 degree towers and 121 degree tower-to-tower spacing ... ideal, actually)…

… and 4) after a lot of engineering work to prove that the M2 charts were wrong in the Santa Monica area, an application was submitted for 50 kW days and about 4 kW nights, from a site in Montebello ... yes, a site on a hill-top ... with six towers, one being skirting on an existing cell tower, requiring a change of COL to Culver City; not built yet, AFAIK.

The last time Culver City had an AM station allocated to it, it was the predecessor of L.A.'s 1020, then on 1000, and the move to 1020 (should have been to 1030, if "by table") occurred simultaneously (or nearly simultaneously) with the implementation of NARBA, back in 1941.

Interesting fact ...Royce's proposed 50 kW day pattern sends its maximum to ... ta da ...
Burbank! But, Royce's proposed night pattern sends its maximum to ... of course
... Culver City, and then on to interfere with Port Hueneme's 1520 (the former 50/1 kW KACY).

Which is why all those engineering $$$'s were spent proving the M2 charts were wrong ... the "interference" had to be shown to be occurring over Santa Monica BAY and not within Santa Monica CITY. Oh, this 1500 incarnation is to be called KIEV (see 870, above).

How many other stations are there out there that use a higher power after the sun sets?
Actually, quite a few, now that "dial a power" is available. Previously, power had to be 0.1, 0.25, 0.5, 1.0, 2.5, 5.0, 10.0, 25.0 and 50.0 kW, and only those, with 0.1 kW only being allowed for grandfathered Class IVs on Class III frequencies. Power, per se, means very little unless the efficiency of the radiator is also known.

There was a 5 kW DA-N station with a 225 degree stick, ND days, and it had to vacate that tall lower. 225 degrees is about 440 mV/m/kW at 1 km. The replacement tower was the minimum conforming stick, 281 mV/m/kW at 1 km. The new power for this station was 12.6 kW, a power which, when input to the short stick, resulted in the same horizontal field as the old, tall stick. There were no changes to the night facilities, and that remained 5 kW into the same separate towers as before.

So, this station is now 12.6 kW days and 5 kW nights, but there is really no difference (except for high-angle effects). The same works in reverse. There are stations with 5 kW days and 50 kW nights.
As you doubtless now know, a small percentage of US AMs have been using higher powers at night than during the day for probably 20 years, if not longer. I think the honors for the highest ratio of night to day power go to KFMB 760 in San Diego (5 kW-D/50 kW-N DA-N). When KFMB moved to 760, it was 5 kW-U DA-N, but years later, it added a third tower to its array and increased night power to 50 kW. The day power had to remain at 5 kW, however, because of the station that is now KBRT, Avalon, Catalina Island. KBRT is 10 kW-D DA-D and puts a dynamite signal into San Diego despite the distance because the path is entirely over salt water.

I suspect that plenty of the overlap between KFMB's and KBRT's 5 mV/m contours lies over land, but a waiver of the rules must have been granted because of the special circumstances under which KFMB moved to 760. (KFMB had operated on 550 but held a CP for 540 with higher power and another station was granted a CP for 550 with facilities that were mutually exclusive with KFMB's old 550 operation.

Then a treaty was signed that granted Mexico the right to use 540 as a Class IA clear channel. This forced KFMB to change its plans to move to 540. The FCC then assigned KFMB to 760, even though 760 was then a US IA channel occupied by WJR.)

For years, another station on 1330--this one, in Campbell (Youngstown) OH--was well known to radio buffs because it not only ran a higher power at night (1 kw) than during the day (500W) but also because it used dual transmitter sites (five towers nights and six towers days). The station (once WHOT; not sure of the current calls), recently lost its night site (well south of the market) and is now operating fulltime from the old day site (within or very near Campbell) using 500W-D/215W-N DA-2, so it now has one site and uses lower power at night than during the day. I believe that the array is efficient enough that 215W produces an RMS inverse-distance field greater than 140.35 mV/m @ 1 km, so despite the low night power, the station was able to retain its Class B status.

I suspect that there are now hundreds of US AMs that run higher power at night than during the day. The New York City market is about to get its third and fourth such stations (unless there are others I don't know about). WSNR 620 runs 3 kw-D/7.6 kW-N, WLIB 1190 runs 10 kW-D/30 kW-N. WMTR 1250 holds a CP for 5 kW-D/7 kW-N, and WKDM 1380 has just applied for 5 kW-D/13 kW-N. Many Class C AMs (grave-yarders) run slightly higher power at night than during the day because, during the day, they must protect Class B stations on adjacent channels. At night, the contours that must be protected by day fall below the NIF limit, allowing the Class Cs to use higher night power.

I think the St Louis station to which Peter Haas referred in a post I just read was WRTH 590 (licensed to Wood River IL). If I recall, WRTH ran 1 kW DA-N but was ND days with 500W to protect the co-channel station in Omaha (then WOW, now KOMJ) and maybe some adjacent-channel stations. Why WRTH didn't directionalize days so it could use the same 1-kW power day and night, I don't know. Years later, that's exactly what the station did do. It's now KFNS, but I'm pretty sure that it has been running 1 kW DA-2 for decades using a more complex pattern by day (four towers) then by night (three).

Now, there are three Class As on 1170: Tulsa, Wheeling, and the Class I-N in Alaska. A move of WWVA to the Cleveland area will result in a severe ratcheting to allow for the other two Class As, plus any interference caused to first adjacent-channel Class As on 1160 (Salt Lake City, UT) and 1180 (Rochester, NY). Note well that the day pattern appears to allow for these realities, and the night pattern appears to be the best possible power using the fewest possible towers, given that its maxima is directed towards Rochester. When CC's WSAI was rebuilt, it apparently had to install a 4-tower DA in order to protect first adjacent-channel Class As on 1520 (Buffalo) and 1540 (Bahamas). However, it was rebuilt as a "multiplication method" array, with the widely spaced sets of towers having minima towards 1520 and 1540, and the narrowly spaced sets of towers having a null towards KFBK, in a parallelogram.

A consequence of the parallelogram array is the pattern is accentuated towards Cincinnati, its current COL, as one might expect, while also having a substantial signal towards Covington, KY, its original COL. (WCKY was the original call). The former three-tower array featured a single null, towards KFBK, as one might expect of an older array.

Scott mentioned the move of KYW from Chicago to Philadelphia as a probable downgrade. But I don't think it was. Chicago in the middle 1930's was overloaded with high powered stations and Westinghouse KYW carried NBC programs and shared with KFKX while the only Philly NBC outlets were WFI and WLIT at 500 watts sharing time on 560. Philly depended on WEAF and WJZ, both in New York City for most of its NBC coverage. KYW came in and became Philadelphia's NBC Red outlet and eventually upped their power to 50 KW. Chicago didn't miss them already having WMAQ and WLS/WENR as 50 KW NBC stations.

WOR got itself into hot water in radio's DA "pre-history" (pre-1936). It originally had a "long wire" antenna, with a radiation pattern that gave maximum radiation towards NYC and Philadelphia and minimum radiation towards the North Pacific Ocean. So far, so good. Since a "long wire" has a symmetric pattern, there was also a null towards Canada. This provided all that was necessary for the allocation of CKVM in Ville-Marie, Quebec. Also, it provided opportunity for the allocation of a full-timer in Niagara Falls, Ontario, with 10 kW days and 5 kW nights, using 6 towers days and 10 towers nights.

WOR's current DA protects these operations, such that WOR's secondary service area ends almost right at the U.S.-Canadian border, in Ontario and Quebec. Therefore, WOR's proposed new array takes these two stations into account, and it even "ratchets" the radiation down, thereby reducing radiation towards stations which may not even exist. Theoretically, WOR could have "walked" its array the mile (give-or-take) from the existing site to the proposed site, but this was rejected.

Cynthia Jacobs, WOR's consulting engineer and designer, had another of her array designs similarly rejected: that of KFAX's similarly forced move. But, in KFAX's case, the ratcheting was on account of several applications, not on account of a deleted station and a soon to be deleted station.

Had WOR originally installed a vertical radiator, it would likely be ND to this very day. ND operation of WOR would not have precluded its being broken down to a Class I-B, retaining the ND, while, first, co-channel Class II-B KMPC was added before WW-II, and then co-channel Class I-B KIRO was added.

WOR does not protect KIRO and what was KMPC. Of course, the breakdown of WOR also allowed for little 710s to pop up all over the western U.S. (Kansas City, Denver, etcetera), and also a 50 kW full-timer in Miami.

Ironically WOR has more to lose than most stations. WOR has already lost. It has little secondary service area outside its own state along the New York-Canadian border. And due to the vagaries of that border, there is a foreign Class B within its secondary service area. Of course, it has a decent enough secondary service area in the South, where presumably it has no listeners. The WOR array design compromises traditional Class A service to "white areas" for improved primary service to Philadelphia and Long Island. It has been that way since its inception, and the directional arrays which replaced the original "long wire" have maintained that tradition.

When KNBR got rid of its "long wire" in 1949, it became ND-U.

The FCC's online data for WABC says they are 50kW non-D, using the same radiator day and night but with different operating constants. Can anybody post an explanation of this...?

Stations which intend to operate ND-1 or DA-1 can submit a CP for ND-2 and DA-2, with the same parameters for day and night, expecting that both will proof, but there being an insurance policy in case one doesn't. In the case of a Class A, 50 kW is required, unless grandfathered.

If a higher efficiency radiator was installed, say one with 400 mV/m/kW at 1 km, whereas the old radiator was 362.10 mV/m/kW at 1 km (the minimum conforming for the class), it IS conceivable that ND-2 operation would be required with 50 kW into the radiator days, and 40.97 kW nights. 40.97 kW into a 400 mV/m/kW at 1 km radiator would give a field at 1 km of 362.10 mV/m/kW. In this case, 50 kW would still be input to the antenna system, nights, but 9.03 kW would be dissipated in a resistor which is considered to be part of that antenna system.

KTNQ-1020 in Los Angeles used to run daytime parameters at times when the skywave would not impact KDKA. I don't recall all the details except that they went to day pattern very early in the morning. Probably after LSR, Pittsburgh, which on a good day could be 2 am Pacific. However, KTNQ's day pattern is a slight modification of its night pattern, and there's nothing it can do about reducing protection of the co-channel Class I-N and the three first adjacent Class II-Bs it protects with its patterns.

WSAI and KFAB, although both are Class I-Bs whereas KDKA is a Class I-A, have more favorable operating hours than do their co-channel Class I-Bs, to the detriment of KFBK and WBT, and for purely historical reasons.

KGBS (predecessor of KTNQ) was 50 kw DA-1 L-KDKA, and it always operated with its licensed day (and night, DA-1 remember) facilities from midnight to 5 am Sunday, Pittsburgh time, which was 9 pm to 2 am Sunday/Monday, L.A. time. KGBS became a Class II-B in the seventies, after KSWS Roswell, the first Class II-A to be licensed, had been operating 50 kW-D, 10 kW-N, DA-2, for about ten years.

KSWS' new 50 kW night DA, paid for by Storer, was especially designed so that it sent no more than 10 kW towards KGBS/KTNQ, nights.

Following the rebuild, does WSAI still run daytime radiation until sunset in Sacramento?
Still licensed to use ND-D from LSR Cincinnati to LSS Sacramento. This was the payback for allowing KFBK to move from a Class IV to a Class I-B, whereas before WKCY had 1530 all to itself.

This is at least WMAQ's second tower. It's previous tower, a sectional, failed at the point of sectionalization and was replaced by a conventional tower. KNBR ... another former NBC O&O, and a contemporary of WMAQ (with KOA and WNBC) ... also installed a sectional, in 1949, and KNBR's still stands, as built.

MORE ON THE IMPACT OF THE INTERNATIONAL AGREEMENTS: Sadly, KYA/1260 never adequately defended its Class III-A allocation and is now hemmed in by stations of lesser class (ex-Class III-B) and is perhaps stuck with 5/1 ND-U, as were KSFO/560 (now 5 kW DA-N), KRKD/1150 (now 50 kW-D, 44 kW-N, DA-2, after buying and taking dark all co-channels), KFOX/1280 (now operating DA-D, but still only 1 kW), KERN/1410, KRED/1480 (has a 185 degree tower, but is ND2 with only 318 mV/m/kW at 1 km), etcetera.

Greatest power difference days and nights has got to be KFMB: 5 kW ND-D, 50 kW DA-N. Was 5 kW DA-N, but with the addition of the third tower across the highway from its original (on 540) array, it increased power to 50 kW nights.

Forced move from 540 to 760 when the mid-1950s U.S.-Mexico Broadcasting Agreement gave Mexico a Class I-A priority on 540, making this the only frequency with two Class I-As (Canada's Class I-A, formerly in Regina, was the historical occupant of 540, after 1941's NARBA). The station gets the benefit of the higher efficiency nights, but is effectively grandfathered at 240 mV/m/kW at 1 km, days.

WGAR's first 50F was original to the NARBA-sanctioned upgrade from 1420 kHz and 5 kW (?) to 1220 kHz and 50 kW.

Scott Fybush wrote about Westinghouse's plan to move WBZ to Provincetown, had the FCC ever been put in place its proposal to allow approximately half of the IA clears to run 750 kW. It certainly would have been interesting. No doubt, WBZ's night signal would have covered a lot more than those chimeric 38 states (and all the best Canadian provinces). But the day signal in Boston and the immediate area, though still the best in the market, would actually have taken a hit. Currently, transmitting from Hull, WBZ, according to the V-Soft signal strength by Zip code Web site, delivers almost 300 mV/m to Winthrop. Winthrop is on a peninsula that juts into Mass Bay (or Boston Harbor) and is a straight shot across salt water from WBZ's transmitter, which must be about 10 miles away.

Believe it or not, the 750 kW directional signal, whose inverse-distance field at 1 mile in the direction of Boston would have exceeded 10V/m, would have been down to something like 150 mV/m 70 miles away. That is, at the waterfront in Boston or Winthrop, the 15X power increase coupled with the move of approximately 60 miles to the southeast would have cut the signal in half. I don't know how WBZ's overall daytime coverage would have fared. The signal on the outer Cape, which is currently not that impressive, would have been so good that everyone with fillings in his teeth could have listened without a radio--whether or not he wanted to listen. But inland in New England, I'm not sure how the coverage would have compared. The greater distance from the transmitter might have, in effect, cancelled out the power increase. On the other hand, in central New Jersey, where you can pick up WBZ now during the daytime because so much of the path from Hull is over salt water, WBZ might have become the strongest AM signal. And then there would have been the problem of phasing from the skywave that followed the great-circle route around the globe and came back to Provincetown as a TA catch. How many hops would THAT take?

Remember that the effect of the DA would have been to effectively double the signal-strength in front of the pattern, producing the equivalent of 3 million watts (from half-wave towers) in front of the pattern. Are there any superpower MW stations, in, say, the Middle East or Russia that run as much as 3 million watts? If so, how do they do in, say, southern Spain or Portugal during daylight hours?

Rob Atkinson wrote about how when WLW ran 500 kW in the '30s, its ground-wave coverage extended all the way to Canada. Certainly not hard to believe, given that it's only, what? 250 miles or so from south to north across Ohio and then another maybe 50 miles across Lake Erie. Remember, 700 is a lower frequency than WBZ's 1030 and the soil conductivity in most of Ohio is quite good.

However, pre NARBA, CBL was on 690--or so I've been told--and WLW had to directionalize to the southwest to protect CBL from wicked first-adjacent interference. No, WLW didn't use two Blaw-Knox diamond towers. Scott Fybush undoubtedly knows what kind of tower WLW used as the other element in its DA and maybe even the distance of that tower from the Blaw-Knox. I've never seen a polar plot of the pattern, but my guess is that the minimum toward Canada wasn't particularly deep--probably the equivalent of 50 kW ND from the half-wave Blaw-Knox tower. If so, the radiation maximum to the southwest could still have been equivalent to about 1 megawatt or in the neighborhood of 10 V/m at 1 mile--significantly more than the strongest 50 kW directional signal in the US today--WWJ with almost 8 V/m @ 1 km (inverse-distance field) to the north at night from a six-tower array--of which only two towers are near half-wave. Still, that's equivalent to more than 350 kW ND from a half-wave tower and almost twice as much from a minimum-efficiency stick.

I don't think Miles city arrived until after all of the former Class IA channels had been opened to Class II fulltime stations, but as for KUOM and WEW, they are both still daytimers. KUOM runs 5 kW-D ND-D, and like all Class B daytimers on ex-IA channels, I presume that it signs on at New York sunrise--probably with 500W. I think it was licensed for 5 kW well before the KOB case was finally decided, which means well before the breakdown of the IA channels. WEW may still be operating with 1 kW-D, the facilities it has had for many decades. In January 2004, WEW applied for (and has since been granted) a CP for 10 kW-D/205W-N DA-2. I don't know whether the improved facilities are on the air yet. I gather that the owner, Birach Broadcasting, opted for the low night power because any more power would have necessitated a change in the station class to Class B.

With such a change would have come the requirement to deliver an NIF signal to at least 80% of St Louis. That would have greatly increased the cost of the project--assuming that a suitable night site could even have been found. It is interesting to note that WEW's 10-kW D pattern protects only WBBM; there is no critical-hours protection to WABC. So yes, when WEW's new signal goes on the air, WABC may suffer a small amount of new daytime-skywave interference, but its hard to ascribe that to the KOB decision--except to the extent that the KOB decision was an antecedent of the breakdown of all of the ex-IA channels.

Where does the old KXA Seattle fit into all of this? They were daytime on 770 for years while the KOB case was being settled. As with most historical stations operating on clears, KXA was "L-WABC", meaning it could operate at night whenever the Class I-A did not. Other west coast limited were 750 in Portland, 1100 in Seattle and 1020 in Los Angeles. There were east coast equivalents, of course, although there is now only one ex-Class I-A on the west coast ... was two, if you count KNX's de-facto Class I-A operation on 1050, pre-NARBA; was three, if you also count KNBR's de-facto Class I-A operation, before two NBC de-facto Class I-A stations were broken down to allow stations to be constructed in Boston ... only two in the seven western states, and four in the southwestern states (640, 820, 1160 and 1200). Incredibly, seven of the ten largest U.S. cities are now in the southwestern Unites States, and only two of these have Class I-A stations (Los Angeles and San Antonio), and two have no Class A stations at all (Houston and Phoenix).

KXA was L-WABC but acted as a daytimer in the 1950's to the time they got full time. WABC just did not go off! That long wire antenna was still in use to the 80's. KXA used to plug KOB when it went off air. KOB came in really well most of the time. No more with 770 at 50d/5n.

From 1965 (KSWS was then the first Class II-A to break down the clears) and for quite a number of years thereafter, only two stations could exist on a U.S. Class I-A channel: the Class I-A in the east, and the Class II-A in the west. Class II-As were a new type of station, supposed to be "of the Class I type", but without requiring modification of the international agreements. (These agreements were later modified, thereby breaking down foreign clears as well). Later, Class II-Bs could be added in under-served areas, anywhere, usually with 10 kW day max and 1 kW night max, but there were notable exceptions in the west, where 50/5 or 50/10 or 50/20 could be found.

Many of these fifty-somethings were rim shots to major cities. And, WABC "won" as it retained Class I-A status, whereas KOB, which had no legitimate historical claim to 770, anyway, was assigned Class II. The courts determined that since New Mexico already had a "station of the Class I type", namely KSWS, there was no need for an additional station of the Class I type in New Mexico. Hence, KOB should have been reduced in class from Class I-B (de-facto, in Limbo) to Class II-B (in-fact) although, through some very careless paperwork handling within the FCC, Class II-A was assigned to KOB, not Class II-B. This became the only exception to the "Class II-A List" ... the FCC's basic blueprint for providing the underserved west with additional, and required, stations of the Class I type.

With KDKA there is a CFRB problem. Can you spell international dispute? Partly Westinghouse's fault. 1010 in Calgary is the NARBA-recognized Class I-A/Class A in Canada. 1010 in Toronto should not have been elevated to Class I-B/Class A, from Class II-B/Class B. Westinghouse, through the FCC, and thereafter through State, should have pressured Canada to retain Toronto's old class. Since there is usually a quid pro quo on acceptances of international changes of class, especially in the case of an off-List change, and most especially when such change is in a border zone, it would be interesting to know what the U.S. received in return for accepting Canada's request for a change in class of Toronto.

Perhaps acceptance of the U.S.'s concept of Class I-N/Class A stations, designated for Alaska, even though this entire class was not in NARBA? I don't know what politics were played in the US. The Canadian politic was that CFRB was already a 1A and they lost the channel (860) to the CBC so some form of restitution was necessary. Why should Westinghouse have complained?? This is not different than their 1020 1030 problem and in my memory there is never been adjacent channel skywave protection. CBR is the "notified" Class I-A ... with the 1010 frequency being taken from San Jose's KQW, which later moved to San Francisco as KCBS (and to 740). If Toronto's 1010 "lost" its priority, that was by Canadian action, not U.S. action. CBR protects WINS to about 25 kW ... which it does not have to do …thereby sending enough skywave towards San Jose (and San Francisco) to make Class I-B/Class A operation from those locations technically infeasible.

CBR does not explicitly protect Toronto. But, WINS was never a Class I or Class A, and it protected the entire U.S.-Canadian border, which certainly included Calgary, explicitly, and Toronto and every other Canadian city, implicitly.

Notice that WRVA's array is spaced 184.9 degrees and its radiators are 185 degrees tall. On 1110, it's pre 1941 frequency, these values would be 180.00 and 180.13 degrees.

Dana wrote that KDKA's 50% skywave extends 750 miles. Nope! Not only does the protected skywave service of all North American Class A AMs terminate at the national border, the rules for calculating the nighttime service areas have changed. 50 kW ND from an (~200 degree) antenna that produces a ground-wave of ~400 mV/m/kW @ 1 km (which is typical for Class As) no longer produces a 0.5 mV/m 50% skywave coverage radius of 750 miles. I don't have the exact distance figures for KDKA, but WSCR's skywave service now extends only to around Buffalo NY--a distance of approximately 450 miles and WSB's extends only to around Baltimore, which may be a little bit more than 450 miles, but not much. In other words, a few years back, with the stroke of a pen, the FCC reduced the nighttime service areas of US Class A stations by approximately 64%. WBZ's nighttime signal in Chicago and Milwaukee is legendary. Nevertheless there is now a full-time Class D AM in the Chicago suburb of Vernon Hills. Yeah, WNVR's nighttime power is low and the signal is directional to the west, but the station is located in an area where WBZ delivers a signal of at least 2-3 mV/m on most nights.

KMJ, Fresno: Over 6,500 mV/m at 1 kM in the main lobe, with 50 kW into four 180 degree towers, and with the nulls filled to about 5 kW. Perhaps the finest upgrade of a Class III-A station yet implemented. This station was earlier 5 kW ND-U on 580, but was a Local in its original incarnation. Incredibly, McClatchey Broadcasting owned two Locals (0.25 kW ND-U) in California's Central Valley, one of which, KFBK, then still under McClatchey ownership, became a Class I-B (50 kW-U DA-2), and the other, KMJ, became 50 kW-U DA-1, this under Infinity ownership.

KXTA appears the biggest baddest in the West with over 7500 mv Days although it is a DA-2 ...
But, it has 203 degree towers, so, although it is 50 kW days and "only" 44 kW nights, the effective power input, adjusting for the increased efficiency of the radiators, is more like 100 kW days and 88 kW nights,

referenced to the Class B minimum. Multiply that by the "gain" of the array, and it is a clear winner ... of something ... in this Nation's second largest market (Los Angeles) ... in this World's fourth largest economy (California).

Detroit is such a depressed (and depressing) city, it is no longer even in the top 10 cities, having been displaced by California's third largest city (San Jose) [*] . The Detroit situation is complicated by move-outs not to facilitate improvement to AM service (which has actually declined), but ... reportedly ... to facilitate acquiring close-in sites for necessary, and required improvements to TV service by co-owned stations.

[*] Interesting fact: of this Nation's ten largest cities, seven out of the ten are in the Southwest, and these seven are contained in just three states: California (3 cities in the top ten, also this Nation's largest economy, and this World's fourth largest economy); Texas (also 3 cities in the top ten); and Arizona (1 city in the top ten).

Boy did this stir up a hornets nest of interesting comments....After fighting with the CDBS (as Peter has alluded to) here's the answer. (Please pardon the formatting)

Call	Freq.	COL	TPO	Tws.	Max mv/m @ 1km andbearing.
WFLF	540	Pine Hills FL	50	4	4861 @ 75 degrees
KFBK	1530	Sacramento	50	2*	5360 @ 345
WALE	990	Greenville RI	50	6	5435 @ 140
KFAN	1130	St. Paul MN	50	6	6348 @ 15
KMJ	580	Fresno	50	4	6494 @ 270
WWJ	950	Detroit	50	5	6653 @ 355
KTLK	1150	Los Angles	50	5	7166 @ 245
WLQV	1500	Detroit	50	9	7382 @ 10

* Note: KFBK uses 180 degree Franklin towers

If there are others, I'd love to hear about them. Note that this is DAYTIME patterns only. The other stations mentioned, with the exception of WLQV which sends a little towards Toledo, have one predominant lobe with which 5K to 6K mV/m is delivered. KFBK sends its 5K mV/m in two completely different directions, for the purposes mentioned, and with only two towers.

I think I heard that WLQV is still on an "STA". The facility goes something like this, over perhaps 20 years (roughly 1985 to 2005) ...5 kW into all twelve towers, nights; 50 kW into the East-most nine towers, days. Sold the land under the East-most three towers, which were actually added when the 5 kW night pattern was created in the first place, from an earlier 50 kW/1 kW nine tower array. Down to 3 kW nights; 50 kW days moved back to the original nine towers. All of these arrays, but most particularly the night arrays, were considered "critical", thereby requiring an operator to be present 24/7. A string of consultants tried to design a new 5 kW night array, this time using the original nine (and now remaining nine) towers. None were technically successful and none were licensed.

KSTP added augmentation to its night array; WTOP changed the phasing of its center tower by +13 degrees, thereby adding null fill to about 1 kW (the end towers remained +/- 65 degrees); both of these were by STAs, so here's where the STAs come in. WLQV noted substantial "interference", most particularly from WTOP, but also from KSTP, and asked the FCC for relief, even though a Class A station (both WTOP and KSTP are Class A) normally cannot cause interference to a station of lower class (WLQV is Class B).

The FCC ordered testing to be done, and many tests were conducted, at WTOP and KSTP expense, which tests proved that WLQV was indeed being interfered with. WTOP and KSTP were still operating with STAs. (If WLQV was operating with an STA, it was on account of the non-standard 3 kW power). Another consultant was hired, and he worked on yet another 5 kW nine tower design. This design was highly optimized, and allowed for 5 kW nights without any changes in the siting of the towers. (Normally, an "optimized" design needs as many "degrees of freedom" as is possible; these factors being any or all of: field ratio, phasing and bearing and distance [siting] of a tower or towers from the reference). Modeling of the stability of this new array design proved that it was stable, and could be considered for elimination of "critical array" status, thereby obviating the need for an operator 24/7. But, this new 5 kW array, on account of its wider "aperture" (beam width) would cause a small amount of interference to KSTP, in Michigan's upper peninsula. But, except for this factor, the design was good.

This design was submitted to the FCC. The FCC accepted the design, on the condition that WLQV, WTOP and KSTP reached agreements with one another, formally accepting the "interference"/interference that each was causing to the other. Although the parties implicitly agreed, no contracts were yet signed. The FCC ordered WTOP and KSTP to pay for the engineering and construction changes to WLQV in order to implement this 5 kW nine tower array design. The 5 kW night array was implemented and proved to be stable, and the FCC stated that it could be considered "non-critical". (One would have to plot the "spurs" within the broad mimima towards WTOP and KSTP, in both the old patterns and the new, in order to observe just how good this new design really was). Additionally, at the last moment and apparently without prior notice to the parties, the FCC granted WLQV 10 kW nights, not the requested 5 kW nights. (The "critical array" status was also removed). WLQV was granted a license for 50 kW days and 10 kW nights, "non-critical"; WTOP and KSTP were still STAd. The parties finally signed the requested and required contracts; the STAs for WTOP and KSTP were removed.

It seems that stations like KFI and KNX in Los Angeles put half of their signals into the Pacific Ocean. The 1A's in New York City would have a little bigger challenge covering New England and the East Coast but I would think that could be overcome rather easily. WNBC operated a DA-1 before its move to City Island (or whatever its called). KNX operated a DA-D for a while, using its former auxiliary tower (since removed) as the second element in the array. This experiment was not successful, possibly because the taller tower should point towards the minima, not towards the maxima, and in KNX's case the taller tower pointed towards the maxima.

KFI is a Class I-A (shared with a Maritime Class I-B which is grandfathered at 10 kW ND-U) and KNX was a de-facto Class I-A on 1050, now a Class I-B in-fact on 1070 (shared with another Maritime Class I-B, this one being 50 kW ND-U). Good designs for coastal Class A DAs with targeted communities north and south of the Tx site can be seen in KGO's (three towers, symmetric in-line, end-fire, non-conforming, DA-1); KOMO's (three towers, slightly asymmetric, end-fire, DA-N); XEPRS' (three towers, symmetric, side-fire, DA-N); and KFBK's (two towers, symmetric, end-fire, Franklins, DA-2).

This was of course the OLD WABC 860/880, now WCBS, which did indeed operate from Columbia Island (originally Pea Island) in Long Island Sound, not far from the current High Island site of WFAN and WCBS. I don't know the years during which WABC/WCBS used Columbia Island, but I'm quite sure that use of the site either predated or coincided with NARBA (3/31/41) and extended into the '60s. The WABC/WCBS tower was unusual. It was 550' high and was topped by a large capacitance "hat." It was a rooftop installation with a salt-water ground. How 'bout THAT? The tower was mounted atop the Tx building, which occupied essentially the entire area of the island except for a broad sidewalk around the perimeter. The tower was of uniform (square) cross section and each face was so wide (could easily have been 20' or more) that the tower might have been self-supporting.

There were, however, IIRC, four guys--one from each corner of the square-cross-section tower at a point maybe half-way up—that ran to anchor points near the island's corners. The Island was technically octagonal in shape but it was actually quite close to square, with the corners cut off. A slip for the launches that ferried the engineers to the site (no remote control in those days) jutted out from one of the long sides. Before the move to Columbia Island, WABC 860 had a 50-kW site in New Jersey with a base-insulated series-fed tower (I remember seeing a photo of the base insulator and the connections to the ground system), but I can't recall the name of the community in which that site was located. As was the custom with high-power stations in those days, the site was pretty far from the COL--much farther than is the current WABC 770's Lodi location from midtown Manhattan. I believe that the site was also substantially farther south than Lodi--maybe near Bound Brook in central NJ.

We need to distinguish between the first WABC and the second, here! The original WABC, which became WCBS, was in Wayne NJ. The files that Xen posted earlier today contained the actual street name, which I didn't have before. I believe the tower in Wayne was a Blaw-Knox diamond. I have never seen a picture of the full tower - just a portion of it in the corner of the frame. That facility was on 860. By the time WABC moved to 880 in 1941, it was on Columbia Island. It became WCBS in 1946.

The second - and current - WABC took those calls in 1953. This is the station that was in "Bound Brook." I put the name in quotes because I've been told that the site was actually just over the line in Piscataway, though it had a Bound Brook mailing address. It was WJZ when it operated there, from the twenties until 1944, when it was abruptly relocated to Lodi. Why abruptly move a 50 kW AM station in the middle of the war? The Bound Brook site was owned by NBC and was where many of its shortwave transmitters, which had been pressed into wartime service by the government, were located. They needed to put up more SW antennas at Bound Brook, and WJZ was by then a tenant at the site (after the spinoff of NBC Blue into ABC a year earlier), so it was off to Lodi. The WJZ tower that stood in Bound Brook was dismantled in pieces and rebuilt at Lodi, and it still stands there today.

As Fred notes, Bound Brook remained in service for shortwave, at least as a backup, into the sixties. By then, VOA had gone from leasing commercial SW stations to either buying them outright (Bethany, Dixon, Delano) or building its own facilities (Greenville). I believe CBS had some shortwave facilities at Wayne, also. I don't know how long those remained in service after the war. I've been told nothing remains of the site there, having been completely redeveloped for housing.

Dana wrote that KDKA's 50% skywave extends 750 miles. Nope! Not only does the protected skywave service of all North American Class A AMs terminate at the national border, the rules for calculating the nighttime service areas have changed. 50 kW ND from an (~200 degree) antenna that produces a ground-wave of ~400 mV/m/kW @ 1 km (which is typical for Class As) no longer produces a 0.5 mV/m 50% skywave coverage radius of 750 miles. I don't have the exact distance figures for KDKA, but WSCR's skywave service now extends only to around Buffalo NY--a distance of approximately 450 miles and WSB's extends only to around Baltimore, which may be a little bit more than 450 miles, but not much. In other words, a few years back, with the stroke of a pen, the FCC reduced the nighttime service areas of US Class A stations by approximately 64%. WBZ's nighttime signal in Chicago and Milwaukee is legendary. Nevertheless there is now a full-time Class D AM in the Chicago suburb of Vernon Hills. Yeah, WNVR's nighttime power is low and the signal is directional to the west, but the station is located in an area where WBZ delivers a signal of at least 2-3 mV/m on most nights.

Keep in mind that Powell Crosley owned WLW at that time. Crosley manufactured radios, and much of the research done at WLW was to understand both the science of AM broadcasting on medium wave (which had only made it to 50 kW a few years earlier) and how to make the quality of broadcasts better for receivers (which Crosley manufactured in abundance). This was the period where many studies at making radio broadcasting better were being conducted: frequency modulation was invented and testing, "HF" (high frequency) AM was being tested (in the 40-50 MHz band where early FM would eventually become commercialized), and different types of excitation and modulation were being tried.

High-power AM in MW was also a point of pride, where broadcasters such as Westinghouse, CBS, RCA/NBA and the Mutual partners all claiming various accomplishments as to fidelity, distant reception (KDKA claimed reception in South Africa on their SW transmitter KFKX), and public service in general. Advancing the science of AM transmission also had the potential to bring the companies involved great profits, since most intercontinental communications was via short-wave relay stations running AM. Transmitters or modulation techniques that could better punch through atmospheric interference had the potential for patent & manufacturing income for the companies working on the science since folks like AT&T, Western Union and RCA who provided intercontinental radio communication links would pay dearly for better technology. At the time, AM broadcasters were also looking for other avenues for income. Since most stations signed off by midnight (since most folks didn't stay up late back then!) broadcasters such as WOR, WLW, WEAF, and the Yankee stations all looked to supplement their income by providing services such as faxed newspapers or information in the overnight hours to supplement their broadcasting expenses. Higher power and better fidelity would improve those services.

WCBS and WFAN, undoubtedly on account of greater high-angle radiation from the shorter auxiliary stick, had to reduce power (to 35kw?). A decade or so ago, the stations could have gotten away with 50 kW into the shorter stick, but ratcheting and other esoterica is affecting even the legacy stations. WOWO's 9800W powered-down Class B night operation receives, I believe, protection (currently only from WLIB) to the 5 mV/m ground-wave contour. In the future, all the other Class Bs on 1190 will allegedly have to protect WOWO to 5 mV/m at night. Because WOWO's site is southwest of Fort Wayne and WOWO has to deliver a 5 mV/m nighttime ground-wave to Fort Wayne, the signal toward New York, though a shadow of what it used to be, is still substantial. WLIB's night facilities had to be designed to deliver an NIF signal to at least 80% of New York's five boroughs, notwithstanding the null in WLIB's night pattern over northern Queens and the southeast Bronx to protect CHTN, which moved from 1190 to 720 almost 20 years ago and will soon move to FM.

Believe it or not, WLIB's NIF (entirely from WOWO) is around 17 mV/m! A couple of hundred miles to the southwest, WBIS's 7-kW night signal (currently a CP) will have an NIF in excess of 21 mV/m, entirely attributable to WOWO's skywave. In other words, the powered-down WOWO delivers a 5+ mV/m 10% skywave to the Baltimore metro and 4+ mV/m to New York. True, both New York and Baltimore used to be well within WOWO's 0.5 mV/m 50% skywave contour, but even the reduced signal covers a lot of territory. Now, if somebody can explain to me why WAFS Atlanta has to protect WOWO during critical hours even though several other 1190 daytimers have recently been granted increased CH power, I'd be really interested to hear the reason. Gotta have something to do with the interference-reduction agreement that WOWO, WLIB, and WAFS negotiated but never implemented. Under that agreement WAFS would have been granted 10 kW-N from five towers west of Atlanta, WLIB would have modified its night pattern, and WOWO would have added one tower and increased its night power to 15 kW with a considerable increase in night signal over Fort Wayne.

I'd be surprised if there were fewer than 200 US AMs that now operate with greater power at night than during the day. A large percentage are Class Cs whose day power is limited to protect first-adjacents. At night, those protections don't apply because the protected stations have such high NIF values. So the first-adjacent Class Cs can use higher night power. One or two stations operate with night powers 10 times as high as their day powers. The first of these was KFMB, which runs 50 kW directional at night, protecting WJR. KFMB's day power is limited to 5 kW-ND to protect KBRT. KBRT is second adjacent to KFMB and transmits from Catalina Island. By no means, however, was KFMB the first US AM to operate with higher power at night than during the daytime.

Curiously, the FCC Media Bureau and the US's largest Christian broadcaster, Salem Communications, seem to be on a mission to reshape the Hawaiian radio dial to increase nighttime protections to Hawaiian AMs, several of which are co-channel with west-coast AMs that Salem owns. At one time, I think it was just assumed that since Hawaii is about 2500 miles from the US mainland, interference to Hawaiian AMs from stations on the mainland couldn't be significant. During that era, KFMB was moved to the then IA 760 channel, whose only two US occupants were WJR and Hawaii's oldest AM, KGU. (The reason for this move was a treaty that turned 540, the frequency on which KFMB then operated, into a

Canadian/Mexican IA channel, necessitating KFMB's move.) Later, KFMB was granted an increase to 50 kW at night sending the equivalent of more than 100 kW at night toward KGU. Although Salem owns it, KGU does not appear to be one of the stations affected by the Hawaiian reshuffling. Salem does not own KFMB, however. The reshuffling in Hawaii involves moving a handful of stations to adjacent channels. I believe that KGU could move to 750 and on that frequency would receive less interference from KXL than it currently receives from KFMB, but for some reason, KGU is not among the Hawaiian AMs affected by what appears to be the largest mass AM frequency move since NARBA, 65 years ago.

Susquehanna picked up ex-WFAA, on 570, one half of that infamous time-share which had WFAA getting alternate hours on 820 (a Class I-A clear channel) and alternate hours on 570 (a Class III-A regional channel). WBAP got 570 and 820, in sequence. Once, 820 occupied the central tower of the 570 array, but now that the two are split (ABC now owns 820), 570 increased the rental to such heights such that 820 moved to its own site. At over 192 degrees tall, WBAP almost has the magic 400 mV/m/kW at 1 km (195 degrees) that all Class A stations have wet dreams over.

The FCC also approved higher-than-normal powers for some Florida AM stations as a result of Cuban interference. I know WFLA was one of them, and I think WINZ in Miami may have been another. Those were former Class III stations, to which a 5 kW maximum applied. 10 kW was granted to 620, on an STA basis. Now, Class II and Class III stations have been merged into Class B, and these have a 50 kW maximum.

WOWO was shared with WWVA, both being assigned to another, but identical frequency. Westinghouse broke it down so that co-owned KEX, which had been sharing with KOB, could become a Class I-B. WOWO thereby also became a Class I-B. A subsequent owner broke it down to a Class B so that ICB's WLIB could go Class B. If WOWO was a Class I-A in-fact [*] , it was for a rather short time. It was likely a de-facto [*] Class I-A for an equally short time. [*] "De-facto Class I-A": a full-power station on a frequency allocated to a specific country, and to a specific city, and operating internationally on an exclusive basis during night hours, before NARBA.

When was WOWO a Class I-A? AFAIK they were always DA-N, even when they had 50 kW fulltime.

Many of what we now call Class I-As and I-Bs certainly started out with lower power. The path to "Class I-hood" usually had 10 kW ND-U as an intermediate step. With specific respect to WOWO, it was sharing an exclusively US frequency with WWVA ... much as WTIC was sharing an exclusively US frequency with WBAL, and WBBM was sharing an exclusively US frequency with KFAB (then of Lincoln). With the reallocation, not necessarily on a strictly +10, +20, +30, +40 and -10 kHz basis, in order to allow for insertion of Mexican and Canadian Class I-A clears by NARBA, came a time when WOWO was reassigned to 1190, and WWVA was reassigned to 1170. Previously, KEX shared with KOB, on 1180. Apparently, Westinghouse elected to break down WOWO, thereby facilitating KEX becoming a Class I-B. Somewhat similarly, CBS elected to take a similar action, and break down WBT, giving KFAB a Class I-B assignment provided it vacated 780, which in turn allowed WBBM to become an unshared assignment. The remnants of KFAB's old 780 operation still exists, as WJAG, perhaps the farthest west W-call.

The story is that the Commission offered WJAR (now WHJJ), Providence, RI 50 kW fulltime use of 890. They said: "Thanks, but 920 at 5 kW is fine for us". And it still is....Must have been the better part of a century ago. WLS had been sharing time with another, on what would become 890. Merger of those two stations resulted in WLS being the survivor, and taking sole control over 890. WLS might have been on 870 when this purported offer of 890 to Providence occurred. If so, 890 in Providence, post-NARBA, would have wound up on 920, which is where it, in fact, is! In any case, the only take-aways of de-facto Class Is from Chicago occurred when Westinghouse moved its KYW, also formerly shared with another, to Philadelphia. Probably 10 kW ND-U in Chicago, as ND operation on 1060 in Philadelphia is mutually exclusive with the NARBA allocation of 1050 50 kW DA-1 to MYC. As is stands, 1050 protects Philadelphia incidentally to its mandated protection of the entire US-Mexican border, and 1060 protects 1050 in order to give itself an interference-free service area to the NE, where there were, and still are, several attempts at dropping in class B on 1060.

As I recall WWL is the only one of the old Class 1A's that was 2=tower directional to avoid wasting power over the Gulf. Four U.S. Class I-As have operated DAs: WNBC/660, with a two-tower on Long Island WWL/870 WTAM/1100 WBZ/1030, which still operates its DA, although it was built for 990.
There are foreign, but North American, directional Class I-As, these being 1540 and 1580.
What's really interesting is this: The U.S. presently has as many Class I-Bs operating ND-U as it formerly had Class I-As operating DA-1: KNBR/680 WGY/810 KOA/850 KNX/1070 WJBK moved back to 1500 (it had been there from 1934 to 1941). The original App indicated 21 towers. 12 were built. They were reduced to 9 later. The original CP was for 10/5, DA-2. Was built, four years later, as 10/1 . The CP for 50/5 came in 1963, it was not built until 1970.

Steve wrote that it cost $1 million 1950's-era dollars to increase WJBK to 50 kW and that the station had been a 1-kW daytimer. AFAIK, WJBK (and it may have had different calls by that time) didn't go to 50 kW (and 12 towers) until many years after Storer built the original 1500 facilities. IIRC, by the time of the increase to 50 kW-D, Storer had sold the station. The original power increase was to 10 kW-D/1 kW-N. Besides the infamous nine-tower array, that increase involved moving WLEW Bad Axe, which had been a daytimer on 1500, to WJBK's old 1490 frequency. That move made WLEW a full-timer. WJBK's original CP for 1500 was for 10 kW-D/5 kW-N, the night portion of which didn't work at 5 kW until Tim Sawyer completely redesigned the phasor less than a decade ago using modern mathematical tools for array design. (The station--now WLQV--was finally licensed for 50 kW-D/10 kW-N.) And prior to its move to 1500, WJBK, like nearly all Class IV AMs of the day, ran 250W-U. 1 kW didn't come to the Class IVs until much later, and it came in two installments--first 1 kW-D/250W-N (in the 60s, IIRC) and then 1 kW-U (in the 70s, I believe).

WJBK moved back to 1500 (it had been there from 1934 to 1941). 1500 was a Local until NARBA became effective. Upon its implementation, all 1500s became 1490s, and 1460 moved to 1500, 1470 moved to 1510, 1480 moved to 1530 and 1490 moved to 1530. Additional foreign and U.S. clears immediately followed the relocated 1460-1490 U.S. clears, and two Regionals followed the new clears. As the same-market frequency spacing was simultaneously reduced from 50 to 40 kHz, and every

market, everywhere, protects the 500 kHz international distress frequency, 540 thereby became available for Canada, and later for Mexico, as a clear. So, the sequence would have gone something like this: 1500 (Local) -> 1490 (Local) -> frequency swap -> 1500 (Clear) Now that you mention it, WABJ was definitely involved in WJBK's move from 1490 to 1500 and increase to 10 kW-D. Was WABJ (and not WLEW) the 1500 daytimer that moved to 1490? But WLEW was also somehow involved in the WJBK upgrade. At least I remember that it was. What, then, was the role of THAT station? Maybe we need Xen to get out the microfiche on WLEW. According to Bob Carpenter's AMSTNS program, WLEW is today on 1340 and is one of the few Class C AM's that runs DA-D (presumably to protect some Canadian). The night ND signal is 241 mV/m @ 1 km, the minimum for Class Cs, even though the night tower is 100 degrees, which would normally produce a field intensity of about 310 mV/m with 1 kW. Was WLEW originally co-channel with WJBK on 1490 and did it move to 1340 to get out of the way of WJBKs new signal?

The option is lowering KWKH to a Class B, and then letting the three 1130s which exist along a line drawn between New York City and Vancouver fight it out to see who actually gets an upgrade.
I know WISN wants one, but Minneapolis was on first, Detroit on second, and Milwaukee on third.
And ... all would have to contend with providing first adjacent protection to KMOX, so WISN really can't do that much with its night signal towards the south, on account of KMOX, even if KWKH were to go Class B [*] . WISN already has daytime minima towards Detroit, Minneapolis and St. Louis, and nighttime nulls towards Detroit, Minneapolis, Shreveport, and, implicitly, St. Louis (this, as a consequence of Shreveport). [*] Presumably, this would be effected by KWKH officially notifying for less than 10 kW nights, thereby reclassifying itself as a Class B, and then refiling as a higher-powered Class B with whatever it could get ... probably less than 50 kW after San Diego, Dinuba, and the three 1130s mentioned above file to let their patterns out.

Plus, Bloomberg's NYC 1130 would likely opt for a pattern change as well, so as to better serve eastern NJ. Hell, given WBBR's array design, I could see that event as allowing this station to get into Philadelphia, nights.

A Class A cannot cause interference to a Class B, although there is one very specific case where such "interference" was deemed to be caused by Class As (plural), and which a particularly fascinating remedy was found. There are no Class As anywhere in Florida, only Class Bs, Cs and Ds. Cuba, which for the better part of the last half century of the last millennium had no Class As at all ... it had abrogated NARBA, hence it thereby lost its sole Class I allocation ... received nearly as many Class A allocations as the entire U.S. had Class I-A allocations under NARBA, during the "Rio" treaty negotiations. Cuba went from zero to twenty-one Class As in one fell swoop. (The U.S. had 25 Class I-A allocations under NARBA, but we elected to break about one-half of these down, as may are well aware).

The Cuban Class As, many of which are on former Regional channels, but some of which are on former Canadian, U.S. or Mexican clear channels, include some which are notified at 300 kW, but many are notified at 30 kW. All are ND-U. Cuban Class As on former Regional channels include 550, 570, 580, 590, 600, 620, 630, 790 and 910.

So, Tampa's 570 can interfere with Cuba's nre Class A on 570 (30 kW ND-U), but not vice versa, St. Pete's 620 can interfere with Cuba's new Class A on 620 (30 kW, ND-U), but not vice versa, Miami's 790 can interfere with Cuba's new Class A on 790 (50 kW, ND-U), but not vice versa, and so forth.

I doubt if the mitigation given to those U.S. regionals, above, was necessarily approved by Cuba, but we do request such approval from Canada and Mexico, in the so-called "border zones". As far as I know, Canada and Mexico reciprocate, in the "border zones".

KFXR (ex-KLIF--and more other calls than I can count) has 16 at two sites--12 (in two north-south lines of six) at the night site in Rockwall, and four (in-line) at the day site, which is more-or-less between Fort Worth and Dallas but, AFAIK, a little north of a line drawn between the two downtowns. WCHB has 10 in an end-fire 2-by-five array south of Detroit but it is NOT #2 in the US in number of towers. I think those honors go to Salem's KNTH 1070 in Houston, which runs 10 kW-D into 11 towers, nine of which are 196-degrees high and two of which are 90 degrees. The shorter towers were added when the station (then KENR) increased from 5 kW-U to 10 kW-D/5 kW-N. The nine tall towers, in a classic 3-by-3 configuration, still constitute the night array.

The two shorter towers together with the center tower and the towers at the east and west corners make up a five-tower in-line sub array with greater than 90-degree spacing. I'm almost certain that KNTH is #1 among US AMs in number of feet of steel in the air. Each of the nine tall towers is 500' high and the each of the shorter towers is 230', so the combined length of all 11 is 4960', just 320' short of a mile. With 11 towers energized all day, KNTH can lay legitimate, albeit not undisputed, claim to the second greatest number of towers in the US. The reason I say not undisputed is that there is at least one 12-tower site in the US (besides KFXR's night site). That is the 1440 station in suburban Detroit that used to be Detroit's Radio Disney affiliate, WMKM.

Since 910, now licensed to Farmington Hills, is now on the air from near Detroit and is carrying Radio Disney, I suspect that WMKM has new calls and is not doing pre-teen programming anymore. The 1440 station has two completely separate six-tower arrays at one site. And if I'm not mistaken an even lower power station also licensed to suburban Detroit on 1090 also has two completely separate arrays--the day array with six towers; the night array with five. This station has the distinction of being one of a fairly small number of US AMs (my guess: in the neighborhood of 100) that run higher power at night than during the day.

As for which array uses the most land, I have no clue if you restrict the candidates to stations licensed in the US. But if you include Canada, I suspect that the winner would be CJCL 590 in Toronto, with a nine-tower array (classical 3 by 3) on the south shore of Lake Ontario west of Niagara Falls. Unless some of the towers' ground systems are severely truncated to stay within property lines, I think a nine-tower array at that low frequency is almost certainly the winner. But just in case I'm wrong, a neighboring installation, CFMJ 640, has eight towers (end-fire from two rows of four).

And to pre-empt the comments, I'm aware that some radials of all towers in both of these arrays are shortened because they would otherwise intersect with the ground radials of other towers. In other words, you can't compute the required land area of either array by multiplying the real estate used by a single tower with quarter-wave radials on 590 or 640 and multiplying by the number of towers. Calculating the required area by that method produces an answer that is too large.

I did calculate the required acreage of the proposed six-tower array of WSRO 650 currently licensed to Ashland MA, were it to be granted a CP for its proposed move to Lexington MA with Tx almost 40 miles to the south in Wrentham MA near the RI border. My answer was approximately 60 acres. Requires a bit more than 1.5 wavelengths from west to east and about 0.75 wavelenth from north to south. I assumed no foreshortening of ground radials because of property lines but I did account for the shortened radials in the area between the two east-west rows of towers, which are only about 90 degrees apart.

I agree with Bob Carpenter that WCBM's six-tower array might be the winner because, IIRC, the array does not sit square to the property lines, so the site probably includes considerable acreage to the northwest and southeast of the gound radials. This land is not required by the array but is part of the site--at least until some builder puts up a bunch os $2+-million (each) McMansions on the currently unused parts of that very attractive tract northwest of Baltimore.

Scott: Are you sure that KTNN was ever a Class IB? I doubt it. I'm not even sure that KTNN was ever a Class IIA. I think that when 660 was broken down, all of the IIAs had already been allocated and KTNN, which became the second full-time station on 660 in the 48 contiguous states, started life as a Class IIB. With Rio, it became a Class B, as did all of the stations that once were IIAs. Had it ever been a Class IB, KTNN would now be a Class A. Had KTNN ever been a Class IB, it would, with great likelihood--but not certainty, have towers of height equal to almost half wave, or more. IIRC, it doesn't.

Seems to me like KTNN started life on a regional frequency and eventually moved to 660 kHz (like KRVN did, from 1010 to 880), but I can't seem to find any listings in any of the radio logs in my possession to confirm my memories. I think KTNN was a brand-new station on 660. KHAC in Window Rock was on 1300 until the late 70's, when it moved to 1110. When the 1-A clears were opened up in the 80's, it moved yet again, this time to 880, where the city of license was changed to Tse Bonito, New Mexico. I remember the difficulty DXers had in finding Tse Bonito on a map when the CP was first awarded.

Class A stations which have installed 225 degree radiators include WSM, WCCO and WCAU, and each of these were later reduced to under 200 degrees. One Class A which now includes a 225 degree radiator in its day and night DAs is KGA, and this has not proved to be a sound idea, yet they are stuck as the radiator is the high-powered tower on the co-located and co-owned station on 790.

KNBR is already top-loaded, yet based upon FCC measurements it does not meet Class A minimums. The radiator is, however, grandfathered at the Class A minimum, as is formerly co-owned KOA with its 207 degree radiator. No other NBC-owned or GE-owned Class A has a radiator which was or is being treated this way. Top loading was well known in 1941 when, presumably, the 225 mV/m/kW at 1 mile, 175 mV/m/kW at 1 mile and 175 mV/m/kW at 1 mile minima were established.

Both the KFI and KNBR towers were constructed post-1941. Both had long-wires, with the KFI long wire being elevated by about 400 feet, and the KNBR long wire being elevated perhaps 350 feet. Could have been a Tee instead of a long wire, but whatever it was is was, in each case, it was suspended from two towers each of which were about 1/4-wave tall. Were KFI to be forced to move in with KNX, it would have a ready-made 495 footer.

KOMA apparently implemented a counter-intuitive strategy for its array design (as did co-channel WKBW, which operates DA-1 instead of DA-N). Rather than site its array to protect WKBW, which would have been normal for a Class I-B, and which would have sent most of its secondary service area out over the Gulf of Mexico, Gulf of California and Pacific Ocean, KOMA sited its array pointing towards the Pacific Northwest. One effect is at night, much of its home state is not served at all. Another effect is every state to the west of OKC, and three Canadian provinces and portions of two others as well, are receiving secondary service from KOMA. Hell, I can remember living in Los Angeles in the '60s and after midnight and all the L.A. rockers were silent, and so also were KEZY/1190, KWIZ/1480 and KEX/1190, these being suburban to L.A., the only rocker you could receive until 5 am that morning was KOMA/1520.

So, Storz, or whomever, decided that maximizing secondary service was primary, while maximizing primary service was secondary. WKBW apparently made some of the same decisions, as it has no primary service east of Buffalo, and, in fact, there is a Class B on 1520 directly opposite it on Lake Erie, in Toledo, and any secondary service area which WKBW has is largely out at sea, in the North Atlantic Ocean. Incidentally, 1460-1490, which would become 1500-1530 after NARBA, were originally classified as "high powered" Regional channels, not as Clear channels, although these were made Clear channels (shared, so they're Class I-B) by action of NARBA.

Don't forget the eternal 770 battle between WABC, New York and KOB, Albuquerque. WABC was left as the only network flagship that wasn't really clear. The alternative was for WABC to install a DA, and become a Class I-B, as the FCC had ruled. Instead, ABC did nothing, became a scofflaw, took the case to the courts which decided that as New Mexico already had a "station of the Class I type", namely KSWS, then 50/10 kW DA-2, and that the "white areas" of that region were, by then, adequately covered by FM, that NM was NOT deserving of a Class I-A, AT ALL! Therefore, it returned the problem to the Commish, which fixed that problem by amending the Class II-A List to include NM, with 770 assigned as a Class II-A to NM, only.

And KXA in Seattle was very much involved in the KOB case. It lost its full time on 570 to KVI Tacoma which was a virtual daytime on 760. KVI filed on KXA's renewal and won the 570 frequency in a Hearing so KXA had little option than to take the 760 and was later moved to 770. Today they are 50kw on 770, daytime and some lesser power at night. You might ask why the FCC gave 570 to KVI? Because Tacoma had fewer stations than did Seattle. So what did KVI do after the war, move to Seattle and leave Tacoma. So much for consistency in FCC actions. But, KVI was once licensed to Vashon Island, from whence comes its call letters, K-VI, and its transmitter is still there, along with all of Seattle's Class As, and many of its Class Bs. Seattle has shuffled calls and frequencies, over time. 950 used to be 1000; 1000 used to be 950.

1360 has been in two cities. 570 has been in three. KXA was L-KOB, and didn't directly figure into the KOB/WABC case. Peripherally, it did, of course, as after "Rio", and all the U.S. Clears were broken down, KXA filed for unlimited time operation, as did Portland's KXL, which had been L-WSB.

NBC-owned WRC 980 Washington built it's "new" installation in about 1936. The day tower has a big iron top hat. It shows up well in Google Earth (and I suppose Google Maps). Back then there was a small-plane airport not far away. 980 now uses the two night towers along with the old day tower to allow 50kW days (still 5kW nights).

It was 1010 in Little Rock. They were 10 kW full time, DA nights. Owned by a monastery I believe. On air since 1922. CBS bought it and shut it down. The station was sending its major lobe, which was quite narrow, and hence quite high in effective power, right at WINS, which was already having troubles with the Canadians, as Canada was able to sneak in 1010 in Toronto as a new Class A (was a Class II-B, before). So, CBS bought the station and took it dark in the classic "interference reduction arrangement". Perfectly legal, and in the present framework of the FCC, perfectly proper, as it has favored a new night service in NYC over the loss of a HUGE daytime and very extended night time service in Indiana, a state with no other Class As, but which is surrounded by states which, collectively, have 10 Class As, including eight former Class I-As. WINS started out as a daytimer, anyway.

Directionals became mandatory when Class I-B clears were allowed more than 10 kW. The only exceptions in the U.S. are KNX, KNBR (ex-KPO), KOA and WGY, and then only because these four stations were de-facto Class I-A clears which were later broken down by licensee action, by government action, or by the effects of international treaties. In fact, there are no U.S. clears which are 50/10 kW ND, although WBT operated that way for a number of years. Mexico operates several (at least three) clears which are still 10 kW ND-N, and are therefore grandfathered at that night power, but these stations are 50 kW days, or are up to 100 kW days after 1989.

New England was/is poorly served by the clears. The only two clears in all of New England are WBZ and WTIC. The reason that 890 would have been offered was because Providence was the state capital of RI, and because a clear channel station there would cover millions of people, both daytime and nighttime. The state of NY received more then their required number of clears-even upstate NY has one more then ALL of New England! Why should Cincinnati have two clears when Boston got only one? Even today, Cincy is less then half Boston's size! If the main city in West Virginia (Wheeling) deserved a 1A clear, why shouldn't Providence?

Wheeling was a time-sharer. It got a full-time Class I-B, shared with KVOO. Fort Wayne got Wheeling's frequency, which it promptly shared with KEX in Portland, both as Class I-Bs. (WOWO and KEX were then co-owned by Westinghouse). So, we had two time-sharers with exclusive (but shared) use of two different de-facto Class I-A frequencies moving from part-time to full-time operation, although sharing their new frequencies with other stations located on opposite sides of the country. (East to Central, in the WWVA/KVOO case, and Midwest to West, in the WOWO/KEX case).

The most bizarre case of a shared Class I-A has to be WBBM (5/9-th of the time) and KFAB (4/9th of the time). In order for CBS to get 780 all of the time it: 1) purchased de-facto Class I-A WBT in Charlotte, 2) broke it down by agreeing to allow KFAB operate full-time with 50 kW on 1110, provided that KFAB vacate 780 forever, and 3) before the three-tower DA could be designed and installed at Charlotte, CBS sold the station to someone else, which new licensee also inherited the covenant to install a DA for nights, and to operate at the MINIMUM POWER FOR THE CLASS, which is 10 kW, until such time as that DA-N was actually installed.

Now we have Charlotte stuck with 50 kW days, and with 10 kW nights for about a decade, and no way to obtain critical materials to effect the change to 50 kW DA-N, and Lincoln, now Omaha, has 50 kW DA-N on Charlotte's frequency, formerly a Class I-A clear, but broken by CBS, and CBS has its 100 percent of its Chicago Class I-A clear on 780. Additionally, KFAB gets to operate ND from LSR in Charlotte, NOT LSR IN OMAHA, and gets to operate ND until LSS in Omaha, with Charlotte getting nothing in return, all because Charlotte had no DA, and could not provide KFAB with the appropriate protection, during every quarter hour period of the broadcast day. In this case, Omaha actually has a stepped-up priority over Charlotte, which formerly was a Class I-A clear.

KRVN installed a 4-tower DA when it didn't have to. Other Class II-As got by with fewer towers, including KTWO which is also 50 kW nights, but has only two towers. Ex-KSWS, the first Class II-A to go on-air has the most, six.

The BCB was laid out with 50 KHz same-market spacing. This was changed to 40 KHz in 1941, and additional stations were thereby dropped into several markets, most particularly New York, but some others as well. Alas, the Clears were laid out without respect to adjacent channel interference from or to distant markets, and the New York metro (then including Newark) had 660, 710, 770 and 880, while the Chicago metro had stations precisely 10 kHz higher than New York, 670, 720, 780 and 890, while other, closer metros were precisely 10 kHz lower, including 700 and 760. (650 and 870 are too far away to be of consequence, with respect to New York, while 680, 730 and 900 are either clear across the Nation, or are foreign Clears, with respect to Chicago).

The mutual destruction which is occurring now was predictable. If the New York stations mentioned were Class Bs, each would be protecting the primary service areas of Chicago, Cincinnati and Detroit during night time hours. Likewise, if the Chicago, Cincinnati and Detroit stations were Class Bs, each would be protecting the primary service areas of New York (and, then, Newark) during night time hours. But, all are Class As, and although not mutually interfering by rule, as all are of the same class, and neither is superior in class to the other(s), that interference is, and has been going on for decades. The presence of IBOC is merely exacerbating an interference process within the primary service areas of many Class As, only some of which have been mentioned, which has been going on for the better part of a century. And, what with some anomalies, albeit predictable ones, such as exceptionally low ground conductivity on Long Island, is it any wonder that IBOC is compromising primary service?

It's far easier to protect the abbreviated primary service area of a Class B than it is to protect the extended primary service area AND the secondary service area of a Class A. Dallas' 1190 needed five towers, in-line, to protect WOWO, with only 1 kW nights. For 5 kW nights, Dallas needed twelve towers, and then it also had to protect Portland, Guadalajara and Tolleson, in addition to WOWO.

Since WOWO's downgrade to Class B, all 1190s are reevaluating their night patterns, and some, including the other North American Class As, have already effected changes. As a matter of fact, the Mexican Class A is, under the "Rio" rules, allowed 100 kW days, although it remains grandfathered at 10 kW nights, although Guadalajara is presently operating 50 kW days and 10 kW nights. In addition, "Rio" allocated three additional Class As on 1190 in Central and South America. Those also have to be protected. "Rio" allows any Class A to go to 100 kW days (subject to National rules, in which cases the U.S. and Canada do not allow more than 50 kW in any case), with the night power as the maximum of whatever it was pre-"Rio" with no antenna system changes, or a maximum of 50 kW, with appropriate antenna system changes.

The three Mexican Class As which were grandfathered at less than 50 kW (20 kW for 1000, 10 kW for 1190 and 1550) may increase to a maximum of 50 kW nights with changes, and 100 kW days, presumably with no changes. The one Canadian Class A which is 10 kW DA-1 may increase to 50 kW days and nights, with antenna system changes. The Canadian Class A (a former Class I-A) which, under "Rio", went from 10 kW ND-U to 50 kW DA-1, may stay at 50 kW DA-1, but it moved twice, and in each case it was 10 kW DA-1. The U.S. Class A which is 25 kW ND-D and is grandfathered at 10 kW DA-N may increase to 50 kW DA-2. For whatever reason, the Commish allowed a low-powered co-channel daytimer to go on-air, presumably as a "first service", several counties to the north of this Class A, thereby limiting this Class A's daytime upgrade opportunities. The Bahamian Class A (also a former Class I-A) which went from 10 kW ND-U to 50 kW DA-1 under "Rio" may go to 100 kW if it wants, but 50 kW is probably more than that Nation needs and 10 kW ND-U is probably more reasonable.

>> You are talking about ZNS 1540? Right? Wrong...it's blocked by a first-adjacent, assuming WRHC is operating on 1550 (instead of 1560, where it was camped out for years until WQEW got it moved back where it belongs...) Although ZNS-1 is a Class I-A by NARBA, it was operating at 10 kW ND-U until "Rio" forced all Class I-As to operate with 50 kW, or whatever higher power they were notified at. This forced ZNS-1 and CBU to go to 50 kW DA-1. ZNS-1 protects Albany and Waterloo at night. Coincidentally with WCKY moving from its failed 3-tower array to its present 4-tower array, protection to first-adjacents on 1520 and 1540 became necessary. Waterloo was apparently designed to protect not only ZNS-1 (Waterloo is a Class I-B, so it is inferior in class to ZNS-1) but a planned-for Class I-B in the Southwest, which was never built. Probably intended for Phoenix (which state has no Class Is at all) or Los Angeles.

Los Angeles installed a Class II-B on 1540 with 50/10 DA-2, but did not provide protection for first-adjacent KFBK, possibly in anticipation of being elevated to Class I-B. When Rose Hills recently redesigned the array for higher night power, the array was redesigned to provide first-adjacent protection to Sacto. Also to a second-adjacent which wasn't being adequately protected in the first place.

Incidentally, "Rio" also affected one Class II-B in a strange way. One in Mexico was notified as 100/50 kW ND-U for the better part of a half-century, but Class Bs are not allowed more than 50 kW at any time, so this station is now 50 kW ND-U on a foreign Class I-A clear. It's the only instance I know of where "Rio" forced a station to reduce its day power.

WIBC claims to be Indiana's first 50,000 watt station. Also, Indiana's highest-powered AM station. Probably true, as WOWO was built in the era of Clear Channel sharing, and it shared time with WWVA, most likely running 10 kW day and night, on a shared basis. WOWO and WWVA would later terminate the time-sharing arrangement (as would time-sharers WBAL/WTIC, and several others), and each became a Class I-B. WOWO moved to 1190, while WWVA moved to 1170. WBAL moved to 1090, while WTIC moved to 1080. WOWO would later be joined by co-owned KEX. Alas, WIBC is, again, Indiana's highest-powered AM station, although by only a few hundred watts at night. As the present KGA case shows, a reduction below 10 kW is NOT necessary to effect a reduction in class to Class B. Likely, WOWO could have been reduced to 50/25 kW DA-N, but not without a little extra expense to ICBC. But, as ICBC was not disposed to "do the right thing", it reduced WOWO to 9.8 kW, clearly below the Class A minimum. KGA proposes 50/15 kW DA-N, which is clearly higher than the Class A minimum.

KHQ and KGA is somewhat like Buffalo's WGR and WKBW ... co-owned and apparently co-located, with one being very low on the dial, and providing large primary service, and the other being very high on the dial, and providing so-so primary service, but very large seconday service. Of course, with KGA's degredation to Class B it won't have any secondary service at all.

KFXR, with the 'landing strip ' tower array! 12 towers! That's insane! I thought there was only one of these, and they took down 3 of theirs a few years ago! The McLendons wanted to up their nighttime power. The had a nighttime power of 1 kW. located east of downtown Dallas on Sycene Road in the White Rock Creek flood plane. This was a five tower in-line that was built as a non-D 1 kw site at sign on in 1947. the four towers were added later when the received a 1 kW. nite CP. They added 5 kW Non-D Day in 1952. In 1959 they added 50 kW. DA using a separate 4 tower day site in Irving, TX west of Dallas with a figure 8 pattern covering both Dallas and Ft. Worth. They originally applied for increasing the towers at the night site but the commission would not accept their application and design for adding three more tower to the night site.

Finally the decision was made to start over with another site east of Dallas in line with Ft. Worth. The design was a 12 tower broadside major lobe which was supposed to make a 50 kW. efficiency in the major lobe toward Dallas and Ft. Worth. We never made the predicted efficiency in the field. Regarding the runway---I believe I have told this story on this forum before, after all the FAA approvals and circulation to all airports in the areas and the FCC granting a CP, we received a notice from the FAA regarding a determination of air navigation hazard. A meeting was called and was held in our auditorium and screening room at our studios.

The report was from a local airport in the county that specialized in weekend gliders. They had a glider pilot that saw the white road down the center of towers with a white road leading up to the building. Our white road was crushed rock the airport runway was white concrete.

The glider pilot mistakenly chose our runway and was corrected while he still had enough height to return to the airport. If you look at the google map you will see the 6 pair of towers in line. There was a road down the center line between the towers with a circular turnaround at each end. There was also a white road up to the building about the size of their airport building. The FAA suggested that we get big black "X's" painted on the white road at the turn-arounds and on the road in two places. We complied using a hiway crew with a tar sprayer to make the 24" wide black stripes in the form of an X.

"Border Blaster" is a word of art which can only apply to under a handful of AM stations in Mexican border towns which operate on a Mexican Clear Channel, and broadcast primarily in English to an American audience. By the U.S.-Mexican Broadcast Treaty, Mexico was allocated six Class I-A clear channels, and a number of Class I-B clear channels (shared with the U.S. or Canada). It is the Class I-A clear channels which are most suitable for use as Border Blasters, as the Treaty also states that Mexico is not limited as to transmitter power, whereas the U.S. is limited to 50 kW. The following are Mexican Class I-A clear channels: 540 (San Luis Potosi, 150 kW), 730 (Mexico, DF, 150 kW), 800 (Cuidad Juarez, 150 kW, but presently operating at 100 kW or 50 kW), 900 (Mexico, DF, 250 kW), 1050 (Monterrey, 150 kW), 1220 (Mexico, DF, 150 kW) and 1570 (Ciudad Acunna, 250 kW, but operating at 50 kW or less for several decades, and certainly at less than 250 kW for more than a third of a century).

Of these, only 800 and 1570 are in a border town, the immediately adjacent U.S. cities being El Paso, TX and Del Rio, TX, respectively. The others are interior to Mexico, and have no significant programming which is in English. And, 800 and 1570 no longer feature English programming, either. The Class I-B clear channels which are less suitable for use as Border Blasters as these are limited to 50 kW nights, and, as of the 1989 "Rio" treaty, 100 kW days, and must operate with directional antennas in order to protect the primary and secondary service areas of co-channel U.S. and Canadian Class I-B stations. Of these, the only ones which are in a border town are 690 and 1090, both now located in Rosarito, somewhat south of Tijuana.

The Immediately-adjacent U.S. city is San Diego, but these stations at one time targeted Los Angeles. 690 operates with a 5-tower directional antenna which favors NNW and SSE, and sends most of its signal, now, towards Baja California. Its former directional antenna favored Los Angeles. Minimum power is sent towards Montreal, Canada, where there is a Class I-A clear channel station. 1090 operates with a 3-tower directional antenna which also favors NNW and SSE, but sends its power equally in both directions. Minimum power is sent towards Little Rock, AR and Baltimore, MD, where there are Class I-B clear channel stations. With the exception of 1570, whose 250 kW transmitter was an RCA, which the station reportedly refused to pay for because it would not work properly, the Mexican Border Blasters have favored Continental Electronics transmitters, 317 for the 50 kW stations and 318.5 for the 150 kW stations.

Some, mentioned above, but not those operating on the border, have home-made transmitters. 800 still has its Continental Electronics, but it is operated at reduced power, presumably 50 kW days and 100 kW nights. 1090 may have a Continental Electronics, possibly a used one. 690 has a Harris DX-100 which is operated at 77 kW days and 50 kW nights. It had a Continental Electronics 50 kW before.

When KNX's 500 foot tower was felled by a terrorist in the 1960s, a pair of maximum height utility poles (possibly 60') was erected and a T was quickly strung. The station was back on-air with 10 kW pretty darn quickly. When reconstructed, a new 195 degree tower was installed (the original vertical was installed for 1050, KNX's original de-facto Class I-A frequency), and an additional 135 degree tower was installed as an auxiliary. I believe that KNX has a 500 foot stick now....Two, a 500' (195 degree) and a 135 degree auxiliary. The two were employed in an ill-fated daytime DA in the 1960s or 1970s, intended to improve their signal in the "Inland Empire". The taller tower was towards the area to be served. Normally, you want the taller tower away from the area to be served, or you want the two towers to be of equal height. With the taller tower towards the "Inland Empire", the signal was increased there, but so also was signal fading. As a 195 degree radiator has almost ideal fading characteristics, although it is not an anti-fading radiator, returning to ND-U made the most sense.

WLAC protects Boston, which had a 5 kW allocation. KIRO protects Los Angeles, which also had a 5 kW allocation. Boston protects Nashville as if Nashville is the Class A that it is. Just as Los Angeles protects Seattle as if Seattle is the Class A that it is. It's just that Boston and Los Angeles were on their respective frequencies as 5 kW regionals before the others were on-air as clears. Remember, 1460-1490, which later became 1500-1530, were classified as regionals (5 kW max), later as "high powered regionals" (10 kW max), and only later became reclassified as clears (10 kW min, 50 kW max). KIRO started out on another frequency, and later moved to 710. Don't know about WLAC.

Remember 1530 (WCKY) does not change pattern on EST or CST, they change pattern on Sacramento, CA time. I believe it is still that way.

It is indeed, most likely because KFBK changed from being a Class IV/ D to a Class I/A late in the game, while WKCY had a complete night- time lock on 1530. Additionally, KFBK is operating with two Franklins, the only ones presently in operation, and these give about 510 mV/m/kW at 1 km, or about 99 kW out for 50 kW in. Consequently, KFBK operates DA during day-time, with reduced radiation towards WKCY, and DA during night-time with greatly reduced radiation towards WCKY. In view of these facts, WCKY probably deserves a waiver to operate ND until LSS in Sacto. WCKY lost most of its DA and when it was rebuilt, it went from a three-tower super-cardioid to a four-tower parallelogram. As a consequence of this change, it had to include protection to both first-adjacents, 1520 in Buffalo and 1540 in Bahamas, nights, but its present COL (Cincinnati) receives improved coverage whereas its former COL (Covington) receives reduced coverage. Days remain ND.

Pretty much anybody on any higher frequency was bumped around by NARBA or other mass frequency shifts. Canada already had 690 and Mexico already had 730, so the bump(s) took place when 740 was inserted for Canada, and again at 800 for Mexico, 860 for Canada, 900 for Mexico, 990 for Canada, 1010 for Canada, 1050 for Mexico and 1220 for Mexico. Obviously, no bump was necessary when 540 was added for Canada. The BCB was extended down from 550 (to 540) and up from 1500 (to 1600) at that same time. No actual bump at 1050 as KNX was reassigned to 1070 (should have been to 1080, displacing the station then on that frequency), while WTIC and KRLD were forced to share 1080, but moving WTIC to 1080 solved the time-share issue with co-channel WBAL. Similar arrangements existed for WOWO (KEX) and WWVA (KVOO), and for the same reasons.

Almost all stations were reassigned by the "table" method, with the change being either no change at all, +10 kHz, +20 kHz, +30 kHz, +40 kHz or -10 kHz (1500, only), and with the eighty or so remaining changes being done outside of the "table" method. As mentioned, KNX was not reassigned by "table". Other prominent stations not reassigned by "table" were WCAU and WOAI, which swapped frequencies, thereby making WOAI 20 kHz (instead of 10 kHz) away from the new Mexican high-power operation on 1220, and WCAU 20 kHz (instead of 10 kHz) away from the full-time operation of WOWO on 1190. Note that KTRB fits perfectly into the pre-NARBA frequency spacing scheme for the SF bay area. 810 (KGO) + 50 = 860 (KTRB) ... 860 + 50 = 910 (KLX/KNEW) ... 910 + 50 = 960 (KROW/KABL) ... 960 + 50 = 1010 (KQW/KCBS) Except that that's not how the spacing for SF Bay Area signals looked before NARBA!

This was the middle part of the dial: 790 KGO 880 KLX 930 KROW 1010 KQW. KGO, KLX and KROW all moved up by table - all the stations on 790 and 880 moved up 20 kc, while the creation of the new Mexican/Canadian clear channel on 900 meant that everybody on 900 and above moved up 30 kc. The US stations that had been on 1010 were split up - KGGF Coffeyville KS to 690, WNOX Knoxville to 990, WHN New York to 1050. KQW, oddly, remained on the "new" 1010 and was briefly the only US station on that channel. (WINS New York, which had been bumped from 1180 to 1000 by NARBA, moved to 1010 shortly afterward.) KQW didn't move from 1010 to 740 until 1947.

As for KTRB in its old Modesto home...it began on 740, but rather than being moved "by table" to 750, as did the other US 740s in Atlanta, Portsmouth NH and Grand Island NE, it moved to 860. GE then owned KGO and WGY on separate de-facto Class I-A channels. 780 and 790, or 790 and 800, I can't remember just this moment, and I'm not going to take the time to pull out my voluminous notes. Anyway, 800 went to Mexico, and, by agreement, KGO and WGY were merged onto one frequency, and that one frequency was adjusted, by table, with WGY remaining ND-U and KGO adopting DA-1. KGO had been ND-U with a long-wire before, just as had co-owned and de-facto Class I-A KOA.

Note that during this process, GE had ALL its de-facto Class I-As broken down to Class I-Bs in-fact. KGO was on 780 (384.4 m) for just over a year - 6/15/27 to 11/11/28 – at which time GE moved KGO to 790, where WGY was already operating. Both stations operated on 790 until NARBA, then were moved by table to 810. KGO remained (nominally) ND-U at 7500 watts with the longwire until the completion of the three-tower DA at Fremont in 1947, at which point it became 50 kW DA-1. So the "breakdown" of WGY's de-facto I-A status actually predates the initial designation of the I-A clears, if I'm not mistaken, and almost certainly could not have happened without the active cooperation of GE - surely it was more valuable to them to have a I-B in Schenectady and a I-B in Oakland than to have a I-A in Schenectady and a regional Class III in Oakland. (Though presumably I-A status in Schenectady would have prevented the postwar drop-in of KCMO Kansas City as a 50/5 kW II-B on 810, at least until the breakdown of the clears many decades later.)

As for Denver, the breakdown of KOA's I-A operation indeed came after NARBA, when several of the daytimers that had also moved by table from 830 to 850 upgraded to fulltime operation (most notably Boston's WHDH, but also Norfolk.) The old 780 kc channel was never a class I - it was the regional channel belonging to KEHE/KECA in Los Angeles, WMC in Memphis, WTAR in Norfolk

VA, etc., all of which moved to 790 by table. And yes, that does mean that KLX and KROW were spaced at the pre-NARBA 50 kc minimum, 880 and 930. Going way back, KGO fit into that spacing scheme, too - it was on 830 from 1925-27, then briefly on 780. The same was true in L.A., BTW ...900 (KHJ) ... 950 (KFWB) ... 1000 (KFVD/KGBS/KTNQ, then of Culver City) ... 1050(KNX) 900 and 950 moved by table. 1000 and 1050 moved outside of the table, with 1000 going to 1020 (should have gone to 1030), and 1050 moving to 1070 (should have gone to 1080). But, if KNX went to 1080, then 1110 couldn't have been dropped in, and then there would have been no easy solution to several time-sharing arrangements (WTIC, WBAL, etcetera).

The frequencies were as you described: 780 (de-facto Class III) -->790 (de-facto Class I-B, shared with co-owned WGY) --> 810 (Class I-B, in-fact). 780 moved to 790, and retained its Class III designation (de facto, and in-fact). 790 moved to 810, and retained its Class I designation (de-facto Class I-A before the KGO moved-in, de-facto Class I-B after that move, in-fact after NARBA). 800 was dropped-in, for Mexico. KROW occupied the 960 spot (and its pre-NARBA position). With one more in that sequence, too: KIEV in Glendale, on 850!

I'm fascinated by the shuffling that took place in the middle of the dial during NARBA. The last frequency in the "up by 30" group to move almost completely by table was 970, where WCFL in Chicago and KJR in Seattle moved up to 1000. (WIBG in Philadelphia moved from 970 to 990 for reasons that will become clear in a moment.) A new Canadian clear was created at 1010, and populated in Calgary and Toronto, with later fill-in US signals in New York (WINS, moved from 1180) and San Francisco, among others. Because of the new 1010 clear, KDKA (980) and WBZ (990) each moved up 40 kc by table, to 1020 and 1030 respectively. Then it got weird. 1000 had been shared by WHO in Iowa and KFVD in LA. WHO followed the table up to 1040, but KFVD, as Peter notes, took 1020, operating L-KDKA, with additional nighttime hours while KDKA was off the air. Stations that had been on 1010, as noted in an earlier post, scattered widely over the dial. 1020 moved by table - KYW in Philly up to 1060.

1030 had been a Canadian/Mexican clear, and those stations were scattered to new spots on the dial. 1040 went by table to 1080 (KRLD, KWJJ, WTIC). 1050 would have gone by table to 1090, but KNX went to 1070 instead, as did KFBI Abilene KS (later KFDI Wichita). 1060 would have gone by table to 1100, but instead its US stations (KTHS in Arkansas, later KAAY, and WBAL) took the 1090 spot that should have gone to the 1050 stations. The "plus-30" table resumes from here - WTAM and KJBS from 1070 to 1100,; WBT and WMBI from 1080 to 1110 (with KFAB, which had been sharing 770/780 with WBBM, moving up here a few years later thanks to the breakdown of former I-A WBT); KMOX from 1090 to 1120, and so on up to my local WHAM, which went from 1150 to 1180. Then it gets weird again, as some of those share-time messes were cleaned up. 1160 had been shared by WWVA Wheeling, which went to 1170 as a II-A alongside KVOO and WAPI, and WOWO Fort Wayne, which went to 1190 as a II-A. 1170 was WCAU Philadelphia, which went to 1210 as a I-A. 1180 had been shared by WINS New York, which went to 1010 as a II-A, KEX Portland, which went to 1190 as a II-A (it was co-owned with WOWO at the time), WDGY Minneapolis (to 1130 as a II-A), WMAZ Macon GA (to 940) and KOB, which deserves a chapter of its own in any history of the clears.

1190 was WOAI, which went to 1200 as a I-A, as well as two smaller stations that became III-A regionals, WSAZ Huntington WV (to 930) and WATR Waterbury CT (to 1320). The regular pattern resumed on the class IV local channel of 1200, which went to 1230. Everything from there up to 1450 followed the "plus-30" table.

WOWO and WWVA had been sharing. WOWO to 1190 and WWVA to 1170 solved that problem, and resulted in two good Class I-B clears. WTIC and WBAL had been sharing. WTIC to 1080 and WBAL to 1090 solved that problem, too, and also resulted in two good Class I-B clears. 1170 --> 1210, on account of WOAI's new first-adjacent "problem" and its own first adjacent "problem". 1190 --> 1200, to place WOAI -20 Hz, not -10 kHz from the new Mexican I-A, which was known to be seeking 150 kW. It is believed to be operating with 100 kW, although its sibling on 800, also created anew by NARBA, and at the same time, no longer has 150 kW capability, but is believed to be operating 10 kW days and 50 kW nights. ("Rio" allowed all non-U.S., non-Canadian Class As to operate 100 kW days and up to the greater of 50 kW and whatever it was operating at before "Rio" nights. Hence, why we have formerly grandfathered at 10 kW Mexicans operating at 100 kW days and 10 kW nights, except for 1000 which is 100 kW days and 20 kW nights).

So, WCAU and WOAI exchanged frequencies, each thereby having a second-adjacent Class I (WOWO/1190 to WCAU/1210 and WOAI/1200 to XEB/1220 respectively), and thereby avoiding a first-adjacent Class I (WOWO/1190 to WCAU/1200 and WOAI/1210 to XEB/1220, respectively). II-As didn't exist, except on paper, until KSWS went on-air in 1965. The less than Class I full-time stations on clear channels before that time were designated II-B. Daytimers were, of course, II-D. The really weird designation, I-D, was not used in the U.S. or Canada. II-As were added, and were intended to be "stations of the Class A type", but these were not actually designated as Class Is/Class As.

As a consequence of "Rio", the heretofore unique (to the U.S.) Class I-Ns were re-designated Class As, and the heretofore unique (to the U.S.) Class II-As were re-designated Class Bs. For many years thereafter, DOC documents still asserted that Class II-A stations were "stations of the Class A type". (Obviously in deference to KOB/KKOB, which had to be resolved by the courts, by giving New Mexico another Clear, except this one being a II-A on 770, and not the I-B on 770, or, better yet, the I-A on 770 which Hubbard was seeking).

WTIC is ... apparently ... one of the very few special cases of Class I-Bs which have a co-channel Class I-B far to the west of them, and for which they (the far eastern Class I-B) are permitted to operate their ND antenna system from LSR of the western station to LSS of the western station, whereas all other eastern Class I-Bs operate their ND antenna system from their own LSR to their own LSS. This gives "drop-in" class II-Bs (now Class Bs) a much more difficult time, and also causes some grief to the western I-B. The reverse is true in the case of 1110, but that is understandable as KFAB acquired a Class I-B priority simultaneously with WBT being degraded from a Class I-A to a Class I-B, but WBT did not install its required DA until after the War (CBS sold WBT immediately after WBT was broken down, and it left the implementation of the DA to the station's new owner, presumably Jefferson Pilot).

That DA wasn't installed for some time, and in the meantime WBT operated with 10 kW ND nights, but that gave KFAB significant grief, so KFAB received a stepped-up priority on 1110, which allowed it to operate with 50 kW ND whenever WBT should have been operating with 50 kW DA-N, but was actually operating with 10 kW ND.

> Living close to the original site and growing up with WBZ/WBZA I
> get sensitive when Boston gets credit for the original WBZ calls.
> WBZ was licensed to Springfield. Over the years Boston became a
> more lucrative market and Springfiled got kicked in the A.

And, your employer/former employer WOR, was originally licensed to Newark, as was WJZ (now WABC, New York).

Funny, how a lot of true "legacy" stations got moved around.

KYW from Chicago to Philadelphia, then to Cleveland (until the FCC "unwound" the at-gunpoint transfer of Ch. 3 and 1060 to NBC, in trade for Ch. 3 and 1100) then back to Philadelphia, again, with NBC coming up with zippo.

But, the would be duopoly of Ch. 3 and Ch. 10 eventually gave NBC what it wanted in the first place, a VHF-TV O&O in Philadelphia, the ex-CBS WCAU-TV (but not the ex-WCAU (AM) former Class I-A, which was retained by CBS).

However, KFBK, Sacramento, was still a Class IV station (local channel) on 1340 while KGDM (later KRAK, now KHTK), Stockton, was a Class II station (clear channel) on 1130. Later, possibly post-WW-II, KFBK moved to 1530 and became a Class I-B station and KRAK moved to 1140, while retaining its Class II status, first with 5 kW nights and subsequently with 50 kW nights. The KFBK array is omni day, then going with a deep null to the east at night to protect an east coast signal ...WSAI has the priority on 1530 as KFBK was only a Class IV (local channel) station on 1340 when it was granted a change to 1530 and an increase in class to Class I-B, and WSAI had been the de-factor owner of 1530 until that time. The whole point in KFBK's array design is service to the entire Central Valley ... both the Sacto Valley (north of the Delta) and the San Joaquin Valley (south of the Delta). Day and night, KFBK sends about 100-125 kW north and south of the Tx site, thereby fulfilling its goal of serving the entire Central Valley of California.

Back to WSAI, which was not its original call, but was the original call of the Class III station which was later converted to a Class I station by a frequency swap. WCKY was on 1490 (a U.S. clear channel) from Covington, KY (hence, W-C-KY), in the 1930s. WSAI was on 1330 (a regional channel) from Cincinnati, OH, in the 1930s. Pre-NARBA, WCKY had moved to Cincinnati and remained on 1490. Post-NARBA, WKCY was moved to 1530 by the table method (+40 kHz). Post-NARBA, WSAI was moved to 1360 by the table method (+30 kHz). Decades passed, including possibly a few call letter changes. By a frequency swap, WCKY became 1360 and WSAI became 1530. WLW/700, WCKY and WSAI are co-owned.

CKLW is not an A and is not Omni (they are DA-2)and in fact a fine example of what I stated above, they put the power where people are. Towards Detroit and Toledo, days. Some towards Cleveland, too. Towards Detroit and Cleveland, nights. Nothing towards Toledo. Quebec City (50/50) and Montreal (50/10) are protected at all times. Mexico is protected at nights, only. A pretty innovative array design, Utilizing only five towers, both day and night. Essentially, there are three lobes: 1) towards Detroit, 2) towards Toledo, and 3) towards Lake Erie, and the various cities which are sited on that lake. Although CKLW is indeed not an A, other Canadian non-As have been elevated to A status by "Rio". (Just for yucks, look at Cuba ... it had no Class Is prior to "Rio", but now it has more Class As than the United States had Class I-As). CKLW, under RKO-General "ownership", advertised itself as a "50,000 watt international clear channel station", during a time when the "words of art" Clear Channel Station implicitly meant a station of the Class I-A type.

Note that KIRO (AM) was one of the last Class I-Bs to be authorized, and that it protects a co-channel Class II-B in Los Angeles (the former KMPC), as well as the co-channel Class I-B in NYC (WOR). The only other such situation ... a dominant station which protects a station of lower class ... is WLAC which protects a co-channel Class II-B in Boston (the former WMEX), as well as the co-channel Class I-B in Spokane (KGA).

The "border-blasters" appear to be a mixed bag. The L.A.-area BBs are Class I-Bs, not Class I-As. 690 is operating with close to maximum "Rio" power, 77/50 kW, DA-2. 1090 is operating with NARBA, pre-"Rio" power, 50 kW DA-N. With over one-half of the population of the world's fifth-largest economy well within range of their signals, more power isn't required, nor is it possible, nights. Plus, there are second-adjacent issues for both stations ... 670/690/710 and 1070/1090/1110. The true border-border-blasters ... 800 and 1570, Class I-As, both ...don't have the benefit of an immediately adjacent foreign metro with huge populations. I have heard that XEROK, ex-XELO, is operating with less than 150 kW. The slightly interior BBs ... 540 and 1050 ... are operating with the usual, for Mexico, 150 kW, covering the local markets in the process. Incidentally, pre-"Rio", Mexico operated a Class II-B with 100/50 kW ND-U, which is actually the "Rio" Class I-B maximum. This station is reported to be operating with the "Rio" maximum for a Class B, 50 kW U, now.

WTIC and WBAL used to be time-sharers. During NARBA, 1050 became 1080, and rather than keep KNX as a Class I-A on 1080, 1080 was made into a U.S. Class I-B channel so that WTIC could get off of WBAL's frequency. KNX was moved to 1070, instead, as a Class I-B. Also helped KRLD, too. You'll notice that a real effort was made to keep the +/- 10 kHz clears farther apart than WBAL and WTIC are. 30 kHz between Charlotte and Richmond. 30 kHz between Baltimore and Philadelphia. The biggest problem with +/- 10 kHz clears are New York's 660, 710, 770 and 880, and Chicago,s being 10 KHz higher, at 670, 720, 780 and 890. Oh, and Cincinnati's 700 being considerably closer to WOR than WGN is. Notice that CBS owns both 1080 clears.

KXEL's towers are top-loaded to 190 degrees. The pattern is an unusual one in that it protects a foreign Class I-A, ZNS-1, which operated with low power until "Rio" forced all Class I-As to operate with 50 kW, and it also protects a low power Class B in Mexico. Or, perhaps that Mexican Class B took advantage of KXEL's sacrificial null towards the southwest.

I know they looked at trying to open the nulls up a few years ago, since ZNS-1 is not operating at 50 KW, but the issue becomes a State Department problem very quickly when trying to get a foreign country to "turn it down and leave it there." In compliance with "Rio", ZNS-1 upgraded to 50 kW, DA-1, and protects KXEL, the only case I know of where a Class I-A protects a foreign Class I-B.

Purchased and taken dark, as was another co-channel station, by Citicasters (or whomever) so that 1150 in Los Angeles could increase from its former 5 kW, DA-N, into a less than stellar performing antenna system to its current 50 kW-D, 44 kW-N, DA-2, into KTNQ's 180 degree (on 1020) sticks, thereby becoming L.A.'s most powerful station, by one measure, with its (five) 203 degree (on 1150) sticks. L.A.'s other "tall" flame-thrower is KNX with one 194 degree stick. KFI's stick is only 176 degrees.

Do you know the story of what happened on 810 (790 pre-NARBA) to get us to the present configuration? Below, the station list in 1928. No WGY on that list, but KGO is already listed, on 790. Was KGO already in their modified figure 8? If so, who were they protecting? (Maybe WGY is simply missing from the list and should have been shown on 790?)

How/when did KCMO 810 come up on the frequency, and under what conditions? 1947, or there abouts. First as 5/1, then as 50/10, finally as 50/5, as best I can determine.

When people insist XTRA ran super power they think of TPO. They never think of the magic a directional array can perform. The array with the highest forward power gain is 1190 in Dallas. The power gain is about 12. With 5 kW in, the effective power out is about 60 kW. Since the "aperture" is rather narrow, a consequence of the 2 x 6 = 12 array configuration, and is directed right over Dallas AND Fort Worth from a site WNE of both of those, while providing protection to Class As in Fort Wayne, IN (lately degraded to Class B), Portland, OR and Guadalajara, Mexico, it is thereby possible to cover two metros with more than 50 kW, equivalent, with only 5 kW in, all while providing protection to three Class As which are all over the map, including two domestic Class As and one foreign Class A.

XETRA runs 77 kW, days, but that is in order to provide the equivalent of its old 50 kW array, specifically in the direction of Los Angeles. The new array provides service, primarily, to Baja California, BCdeN and BCdeS. Class As, such as XETRA, can run 100 kW, days only, provided international protections, especially in "border zones" are maintained, hence the limitation to 77 kW and not the full 100 kW, on account of 710 in L.A.

WOWO was fairly late to the big-power game, but then it was fairly late to the full-time game, too, sharing time at night with WWVA on 1160 until 1941, when 'VA went full-time on 1170 and WOWO on 1190. I suspect the delay in going to the full 50 on 1190 had to do with a transmitter site move - the 10 kW operation on 1160/1190 was at a site described as "Jct US 30/33," which I think is still the same spot where those two highways merge, about four miles northwest of Fort Wayne near exit 109 of present-day I-69. I don't know why it took so long for them to relocate to Roanoke; the land around the site is very undeveloped even now, and must have been really empty 53 years ago. 1954 that was probably when the 1190 channel was modified. Peter Haas probably knows what happened.

Whatever happened allowed KLIF to go 5 kW. Non-D day from 1 kW. Non-D day. I know that KEX and WOWO were the two 50 kW's on 1190 when I was there and KLIF 1kW. DA nite along with, KRDS w/250 Watts DA night and possibly a Kansas City station at night. Under the original allocation plan, Regionals were limited to 5 kW, with most Regionals being limited to 0.5 kW or 1 kW, nights, and Clears were 10 kW, with only a few being 50 kW. So-called "high-powered Regionals" were also limited to 10 kW, in part because of their very high frequency, 1460-1490, later to be reassigned 1500-1530, when these were also reassigned Class I-B.

So, 10 kW is consistent with the plan for the Clears, and KYW and numerous others ran 10 kW, nights, until DA theory was proved. It is tragic that WOWO, once the dominant station on 1190, and, therefore, a de-facto Class I-A, is now degraded to a Class B, and not even to 10 kW, but 9.8 kW. I believe XEWX was granted 10 kW ND-U on 1190 under the US-Mexican Standard Broadcast Agreement, which took full effect nearly 15 years after NARBA. So, 1954 seems consistent with 50 kW for WOWO, as 1955 was about when the aforementioned agreement took effect.

More than 1 kW nights from that 5 tower inline site probably was mutually exclusive with XEWK.
The 12-tower array protects WOWO and KEX, for sure, and also XEWK and that then 0.25 kW in Tolleson, AZ. As with all non-Canadian, non-US, non-Bahamian Class As, XEWK is allowed to operate at 100 kW days, and at whatever power it was grandfathered at, or 50 kW, whichever is least, nights.
As XEWK was grandfathered at 10 kW, it may, and does, run 100 kW/10 kW. Other Mexicans in a similar boat are 1550 (100 kW/10 kW) and 1000 (100 kW/20 kW).

What became 1000 after NARBA was originally assigned to Seattle as a de-facto Class I-A clear as KJR. KOMO and KJR swapped frequencies, resulting in KJR on 950 and KOMO on 1000. Back then, there was a 50 kHz "same market" separation, not the present 40 kHz "same market" separation. The presence of WCFL on 1000 was due to political pressure, and, consequently, it broke down 1000, for purely political reasons. The breakdown of 810 and 1190 was due solely to the decisions of the licensees, GE in the case of 810, and Westinghouse in the case of 1190, for otherwise, KGO and KEX would be on other frequencies, and very likely NOT Class I-Bs, while WGY and WOWO would have retained Class I-A status.

How did it so happen that 1200 was reserved for only WOAI day and night, if I recall, for all those years? There must be a story there that I never heard. U.S. Class I-A Clears are: 640, 650, 660, 670, 700, 720, 750, 760, 770, 780, 820, 830, 840, 870, 880, 890, 1020, 1030, 1040, 1100, 1120, 1160, 1180, 1200 and 1210, since 1941. Additional, de-facto U.S. Class I-A Clears existed within that range, but the owners elected to break these down to Class I-B Clears. What are now 810 (GE), 1110 (briefly, CBS) and 1190 (Westinghouse) are examples. Notice that these are immediately adjacent to, or are within a group of U.S. Class I-A Clears. WOAI switched dial positions with WCAU when both went +30 kHz during NARBA, thereby giving WOAI 1200 and WCAU 1210. Before, WCAU was 10 kHz below WOAI.

KFVD was on 1000, and was licensed to Culver City. It was later moved to Los Angeles.
Pre-NARBA, the L.A. area BCB was ..., 900, 950, 1000, 1050, ..., as, then, the "same market" minimum spacing was 50 kHz. NARBA moved KNX from 1050 (to make way for a new Mexico Class I-A clear)to 1070, NOT using the "table" method.

900 and 950 were both moved by the "table" method to 930 and 980, respectively. KFVD should have been moved to 1030, also by the "table" method, but it was moved to 1020, instead. In a sense, KTNQ really has no "historical" claim to 1020, other than chance, oh, and paying-off KSWS to directionalize so Storer could get a viable unlimited time operation on 1020 in the late 1970s, as, otherwise, KSWS would be sending its night signal almost directly at L.A.

The move to near 1090 was a natural one. Both share the explicit requirement for an eastward null, towards Montreal (Canadian I-A) in 690's case and towards Baltimore (U.S. I-B) in 1090's case, and the implicit requirement for a westward null, towards the Pacific Ocean. This gives both a decidedly north-northwest/south-southeast pattern, with 690, now, using five in-line conventionally-spaced short towers in an end-fire array giving preference to coverage of Baja California, and with 1090, as always, using three in-line widely-spaced tall towers in a side-fire array giving equal coverage to Western North America and to Baja California. "Rio" changed the rules for Class As, allowing certain signatories to increase the day power of their Class As to 100 kW, while maintaining those stations' night power at what it was before. So, we now have 690 with 77 kW days and 50 kW nights, the 77 kW gives service to Los Angeles about what it was before the move, with the old pattern.

Mexico has three Class As which are grandfathered at less than 50 kW nights (two at 10 kW and one at 20 kW), but these stations are operating with 100 kW days. Under U.S. and Canadian national rules, a Class A must operate at 50 kW, and there is only one U.S. Class A which is grandfathered (at 25 kW days and 10 kW nights), while Canada has three which are grandfathered (at 10 kW day and night).

Ex. XERF is notified at 250 kW, but it hasn't had a 250 kW transmitter in half a century. And, in fact, it was operated at 10 kW for many decades and until very recently. Now, it is at 50 kW, but still five-times less than its notified power. XELO is notified at 150 kW, but it is running 100 kW or 50 kW, depending upon whom you choose to believe. IF ... and that is a big if ... they are a Class A and were notified at a power and efficiency in excess of 50 kW and 362.10 mV/m/kW at 1 km (both of which are the minimum power and efficiency for the class), then they may maintain their notified power and efficiency.

540 is notified at 150 kW, and it is also notified at 440 mV/m/kW at 1 km, but such a tower would be 1,130 feet tall, and the actual height of the tower is more like 680 feet. Over time, these apparent anomalies are being shaken out of the system. Incidentally, XELA is one of two (830 and 1030) which were special arrangements during NARBA, for which the United States got 800 and 900, grandfathered at 5 kW ND-U, and for Alaska, only, in return for 830 and 1030, also grandfathered at 5 kW ND-U, for Mexico City, only. XELA is still running 5 kW nights, but 10 kW days, and Alaska has abandoned one of its two entitled frequencies on account of interference from Canada. (The rash of Class I-N allocations more than made up for it as Alaska now has more Class A stations than any other state). The 830 and 1030 allocations to Mexico, and the corresponding 800 and 900 allocations to the United States, are Class II-B allocations, hence Class B allocations, and those always have a day ceiling of 50 kW, but a night ceiling of 5 kW, unless and until the U.S.-Mexican Standard Broadcast Agreement is renegotiated.

However, before "Rio" rearranged the deck chairs on the Titanic, all four stations rigidly maintained compliance with the 5 kW ND-U treaty requirement. As far as I am aware, Mexico has never abrogated its standard broadcast treaties with the United States. In fact, Mexico appears to be living within both the letter and the spirit of those treaties, as once "Rio" became effective, and Class II-Bs (Class Bs) were limited to 50 kW, Mexico reduced its one Class II-B/Class B 100/50 kW operation to 50/50 kW.
XETRA is a Class A, and under "Rio", 100 kW is permitted. But, then there is the problem of 710 in L.A. So, XETRA apparently elected to maintain, but not increase the "prohibited overlap", and chose 77 kW days, and a revised day pattern, which day pattern sends about the same mV/m towards L.A. as its old day pattern and 50 kW day power sent.

"Rio" also mandated that all Class I-As operate at 50 kW, if they were not already doing so. Hence, ZNS-1 (1540) and CBU (1580) both installed 50 kW transmitters and DA-1 arrays so that the letter of the "Rio" treaty would be met. Of course, CBU (AM) is gone, and the 1580 frequency has been moved twice since. You're thinking on 1580 of CBJ, Chicoutimi Quebec. Even at 10 kW, they'd own the frequency at night. CBU 690 Vancouver is still on; seems the proposed FM move-to won't be able to duplicate the 690 coverage. Whatever the call, I was thinking of the NARBA incarnation of 1580, which was assigned by treaty to Chicoutimi, Quebec, Canada. CBC ran it at 10 kW until "Rio" forced it to move to 50 kW. Incredibly, it elected to install a three-tower DA, and to operate DA-1. Now operating at 10 kW DA-2. Still Class A. Bahama's ZNS-1 was similarly forced to move to 50 kW, and to install a DA. But, it is now operating with 30 kW, DA-1. Still Class A.

Well, here is the scoop from el Comision Federal de Telecomunicaciones:
http://www.cft.gob.mx/wb/Cofetel_2008/Cofe_estaciones_de_am_
XEROK 800 is listed as 50 kW days, 50 nights ("en la noche").
XERF 1570 is shown as 100/100
XEWA 540 is 150/150 (I once corresponded with their CE a long time ago)
XEG 1050 is ostensibly 100/100
XERED 1110 is 100/50

En el Distrito Federal, (Cuidad de Mexico):
XEN 690 100/5 (that is not a typo)
XEX 730 100/100
XEW 900 250/250
XEEP 1060 100/20
XEB 1220 100/100

Now, whether or not the stations are running more or less power is another subject entirely. But this is what their licensed powers are supposed to be, according to the Mexican government. There are several stations authorized for 50 kW, and of course XETRA at 77/50, but I believe we were discussing "superpower" stations. You can go to the above link and find all of them.