

FROM PETER HAAS IN THE RADIO BROADCAST REFLECTOR; COURTESY OF BARRY MISHKIND

NARBA Signed in 1939, became effective early 1941. There were several "side letters", and it is my recollection that The United Mexican States (Mexico) did not actually sign the NARBA agreement, but it signed a U.S.-Mexican broadcast agreement, although Mexico went along with most of the provisions of NARBA.

The shifts were either: none, +10 kHz, +20 kHz, +30 kHz, +40 kHz, or -10 kHz. These accommodated the insertion of foreign clears at numerous positions, plus the wholesale move of U.S. clears on 1460 through 1490 to 1500 through 1530 (+40 kHz), and the wholesale move of all locals on 1500 to 1490 (-10 kHz).

Clears which were inserted included 740, 800, 860, 900, 1220 and perhaps some others. The BCB was extended from 550-1500 to 540-1600 in the process. New U.S. and foreign clears were added above the highest U.S. clears, thereby resulting in 1540-1580. 1590 and 1600 became new regionals. Last, but not least, 540 became a new clear. Prior to NARBA, the required same-city frequency separation was 50 kHz. 40 kHz after NARBA. As 500 kHz was the international MW emergency frequency, and every locality had to protect that frequency, 540 kHz was available for BCB use only after the separation reduction to 40 kHz was agreed to by all parties.

"633 stations from 880 kHz to 1450 kHz were moved up 30 kHz" These were moves by the so-called "table method".

"11 stations from 880 kHz to 1450 kHz were moved up 40 kHz" These moves were not done by the table method.

"11 stations from 1460 kHz to 1490 kHz were moved up 40 kHz." These moves simply moved the entire group of the highest U.S. clears into the newly expanded BCB.

"63 stations on 1500 kHz were moved down 10 kHz." These moves simply moved all locals on 1500 down to 1490, and made way for the clears on 1460 (KSTP and WTOP) to move to 1500, thereby making the highest U.S. clears 1500 through 1530.

"41 stations were moved in other ways." These moves accomplished elimination of, to the greatest degree possible, frequency sharing arrangements, such as WOWO/WWVA, WTIC/WMAR, etcetera, and conversion of some daytimers to full-timers.

Several new Class I-Bs were created thereby, provision was also made for later Class I-Bs was made thereby, and some non-table moves were done in order to effect greater separation from new Mexican clears.

WOAI would have moved to 1210 if done by the table method, and that would have caused it grief with respect to the new, super-powered Mexican clear on 1220, so WOAI moved to 1200 and WCAU moved to 1210 in its stead.

63 + 11 = 74, and it is my recollection that there were 86 non-table moves, not 74.

Insert new Canadian on 540 as the minimum MW spacing was changed from +/- 50 to +/- 40, and 500 had to be protected in every market, everywhere, as it was the world-wide MW emergency frequency. 640 KFI>650 WSM>660 WEAJ>670 WMAQ>680 KPO> <--- 690 ceded to Canada, formerly U.S. Navy station NAA, Bethesda, MD>700 WLW>710 WOR>720 WGN/WLIB> <--- Mexican on 730 stayed the same > > <--- Insert new Canadian at 740>740 WSB ---> 750, +10, by table, on account of 740 to Canada>750 WJR ---> 760, +10, by table>760 WJZ ---> 770, +10, by table>770 WBBM/KFAB ---> 780, +10, by table, WMMB is 5/9 sharer, KFAB is 4/9> sharer, otherwise no change ... change to 100 percent WBBM and KFAB to> 1110 took place after CBS bought WBT and broke it down to a Class I-B,> effective 1941 or thereabouts, but WBT didn't complete its part of the changes until 1950 or thereabouts ... CBS sold WBT after it broke it down, but before any of the required changes were actually implemented > <--- Insert new regional at 790> <--- Insert new Mexican at 800>790 KGO ---> 810, +20, by table, should be WGY as KGO was then on 960; KGO operated with a "long wire", with a Figure-8 pattern, until about 1941,> thereby explaining why KCMO had to protect WGY (formerly a de-facto Class I-A, and later a Class I-B, in-fact, *and* KGO, formerly a de-facto Class III-something, and later a Class I-B, in-fact), on account of new Mexican on 800. >800 WFAA/WBAP ---> 820, +20, by table WBAP is 1/2 sharer, WBAP is 1/2 sharer >810 WCCO ---> 830, +20, by table>820 WHAS --> 840, +20, by table>830 KOA ---> 850, +20, by table>850 WWL ---> 870, +20, by table>860 WABC(WCBS) ---> 880, +20, by table>870 WLS/WENR ---> 890, +20, by table> <--- Insert new Mexican at 900>970 KJR/WOC ---> 1000, +30, by table, KJR and KOMO exchanged frequencies later, with KJR taking KOMO's 950 and KOMO taking KJR's 1000, on account of new Mexican on 900> <--- Insert new Canadian on 1010, displacing KQW, San Jose, which later became KCBS on 740>980 KDKA ---> 1020, +40, an exception, on account of new Canadian on 1010>990 WBZ ---> 1030, +40, an exception>1000 KYW (Chicago) ---> Moved to Philadelphia, on 1060, thereby reverting table to +30>1020 WHAS ---> 1040, should be WHO, not WHAS>1040 KRLD/WFAA ---> >1050 KNX/WHO/WOI ---> 1070, +20, an exception caused by ceding 1050 to Mexico, WOI was a daytimer (limited timer while KNX was a de-facto Class I-A), WHO was as above, should have gone to 1080 by +30 as a Class I-A, in-fact, but the powers that be wanted 1080 for KRLD and WTIC, WTIC then being in a time-sharing agreement with WBAL>1060 WBAL ---> 1090, +30, by table, thereby having WTIC vacate this frequency>1070 WTAM/WEAR ---> 1100, +30, by table>1080 WBT ---> 1110, +30, by table, later broken down (see WBBM)>1090 KMOX ---> 1120, +30, by table>1100 WLWL/WPG ---> 1130, by table, but should be KWKH and WNEW>1110 WRVA ---> 1140, +30, by table>1130 KSL/KFKB ---> 1160, +30, by table (KFKB was a daytimer, or "L-KSL")>1140 WAPI ---> 1170, +30, by table, as a daytimer, then to 1210, also as a daytimer, finally to 1070, as a full-timer (I've seen the licenses, so I'm pretty sure about the sequence)>1150 WHAM ---> 1180, +30, by table>1160 WOWO ---> 1190, +30 by table, with time-sharer WWVA going to 1170, by exception (Westinghouse later broke down WOWO so its co-owned KEX could also have 1190, now as a Class I-B, in-fact)>1170 WCAU ---> 1210, +40, by exception, exchanging "+30" positions with WOAI>1180 KEX/KOB ---> both were daytimers, or time-sharers, or

limiteds

>1190 WOAI ---> 1200, +20, by exception, exchanging "+30" positions with WCAU, on account of new Mexican on 1220, which, operating with high power, would otherwise kill WOAI, if WOAI was on 1210
> <--- Insert new Mexican on 1220(all after this were +40, by table, or -10, by table, the -10, by table, vacated 1500, formerly a de-facto Class IV, by moving all such stations to 1490, previously, 1460 through 1490 were U.S. de-facto Class I-Bs, became 1500 through 1530 by table)> <--- Insert new clears at 1540 through 1580> <--- Insert new regionals at 1590 and 1600.

The NARBA-sanctioned exceptions ... both the 48-state ones ... were 50 kW DA-1, protecting the entire U.S.-Mexican border day and night, 1050 and 1220 kHz. The other NARBA-sanctioned exceptions ... 800 and 900 kHz for the non-contiguous U.S. (Alaska, specifically) and 830 and 1030 kHz for Mexico (DF, specifically), were 5 kW ND-U.

Interesting fact: of all the U.S. stations moved by NARBA (signed 1939, implemented 1941), only about 86 were NOT moved by the "table method". So, one really only has to remember the exceptions to the "table method". And it is in the exceptions where a lot of interesting stuff happens ... such as KEX becoming a Class I-B on 1190 from time-sharing with KOB on 1180, and KRLD moving to 1080, which should have been a KNX's new frequency if it Remained a Class I-A, which it was when it was on 1050.

WDGY was previously on another frequency and presumably at a lower power. Probably another site as well. As a consequence of NARBA's AM frequency "cage kick", three stations were moved off of that one frequency, with two going to 1130 and another going to 940, thereby making that frequency a U.S. Class I-A.

After 1941, the "high powered regionals" were reclassified as Class I-B clears, and while some may have operated 50/10 kW non-directional, every one eventually installed a directional antenna for night operation with 50 kW, and two use directional antennas days, while one uses the same directional antenna days and nights.

[*] Here, I am referring specifically to that paragraph of Part 73 which states, "... and on such-and-such kc, one [Class I] station shall be permitted ...", as this defines what was a de-facto Class I-A station, before 1941, and what was a Class I-A station in-fact, after 1941. This paragraph was updated as the list of such stations changed. These changes occurred, for instance, when KGO and WGY, then both owned by General Electric, and each operating on separate, but immediately adjacent channels, were combined, with KGO moving to what would become 810, joining WGY there, while that frequency which would become 800 if KGO had remained a de-facto Class I-A, went to Mexico. This action caused KGO and WGY to become de-facto Class I-Bs, and the U.S. lost a clear channel in the process. Other examples would include 680 and what would become 850, when 5 kW full-time stations were permitted in the East, as regional stations. Although these particular actions occurred separately, each of these actions resulted in the stated frequency being removed from the one-station list, and being placed into the list which states, "... and on such-and-such kc, Class I and Class II stations shall be permitted ...", as this defines what was a de-facto Class I-B station, before 1941, and what was a Class I-B station in-fact, after 1941. Of course, any station on those frequencies which was not a Class I-B, de-facto or in-fact, was a

Class II-B station if operating full-time, or was a Class II-D station if operating LSR to LSS. Those 5 kW stations would later be permitted to increase to 50 kW. Class II-A stations did not exist until 1965, and this class, as well as Class I-N, were unique to the U.S.

Another example would include 710, when a 5 kW full-time station was permitted in the West, as a regional station, and with essentially the same effect as happened to 680 and 850.

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 certain station's primary service?

Back then, 1460, 1470, 1480 and 1490 were "high-powered regional" stations, NOT "regional" stations. Regionals were 0.5 or 1 kW, with a some being 5 kW days and 1 kW nights, and a few, including KHQ, being 5 kW U. The maximum for "high-powered regionals" would later be raised to 10 kW, making these have the same usual power as the clears. The theory was these stations had such a high frequency that 10 kW was needed in compensation. (Recall that not all clears operated with 50 kW, even after NARBA, so there was a time when the traditional clears operated with 10 kW, while these "high-powered regionals" both operated with 10 kW, whereas the true regionals were limited to 5 kW until 1989, or thereabouts). NARBA moved 1470 to 1510, and converted all "high-powered regionals" to Class I-Bs. 50 kW, therefore, became the maximum, and 10 kW became the minimum power for these stations.

There were two Class C stations on regional channels which were grandfathered at 100 watts (0.1 kW). But these are no longer permissible, and, indeed, one has been deleted. The minimum RMS for a Class B is 140.82 mV/m/kW at 1 km. This can be met with about 100 watts into a 225 degree radiator. Any combination of transmitter power, and radiator efficiency, which can produce a minimum of 140.82 mV/m/kW at 1 km can be licensed as a Class B, and on any frequency except 1230, 1240, 1340, 1400, 1450 and 1490.

Some stations intentionally apply for a tad less than 140.82 mV/m/kW at 1 km, so that these stations can be Class D, and, therefore, be exempt from COL coverage requirements. The usual strategy is to apply for the maximum possible for days, and just under the minimum for nights.

I know in the 1920s the T-top wire antenna was the standard broadcast antenna but in the 1930s these were replaced by vertical tower radiators. What station began this revolution? The first place to look is those stations which were first authorized to use 10 kW, which is the clears, and those clears were de-facto Class I-A clears. Regionals were mostly 1 kW, and were granted 5 kW sometime later, and it would be at that point where the vertical vs. horizontal issue would first appear for them. The regionals on 1460 through 1490, which became 1500 through 1530 after 1941, went through a transition from 5 kW to 10 kW as "high powered regionals" far before they were reclassified as clears, and the H vs. V issue would occur for them at both the 5 kW and the 10 kW levels. It's pretty clear that the H vs. V issue exists at the 50 kW level, and some clears didn't increase to 50 kW until after WW-II. So, the first place to look are: 640, 650, 660, 670, 680, 700, 710, 720, 750, 760, 770, 780, 810, 820, 830, 840, 850, 870, 880, 890, 1000, 1020, 1030, 1040, (1050) [*], 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1160, 1170, 1180, 1190, 1200 and 1210, and the second place to look are: 1500, 1510, 1520 and 1530.

You can translate those post-1941 frequencies to pre-1941 frequencies.

[*] 1050 was a U.S. clear until NARBA gave it to Mexico, thereby forcing KNX to move to 1070. "By table" KNX should have moved to 1080, but 1080 was used to solve the WTIC/WBAL time-sharing "problem" (WTIC took 1080, WBAL took 1090), just as 1190 was used to solve the WOWO/WWVA time-sharing "problem" (WOWO took 1190, WWVA took 1170).

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 KSWB 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.