

# **NEW MEMBERS**

We are very pleased to welcome our latest members: Chul, HL5BXW #22497, Maru, JJ1LNR #22498, Abdula, 7Z1BGG #22499, and Fuad, YC5ARA #22870.

# SELF-INTRODUCTION - CHUL, HL5BXW, #22497

Hello. My name is Hyung Chul Yoon, but my given name is Hyung Chul, and I use Chul for my Ham handle. I live in the city of Busan and am in my late 50s. I got my phone class Ham license when I was a high school boy and was active in the school club station and as HL5BXW. But my frequent moves due to job location made it difficult to QRV. I restarted Ham about 2 years ago and am learning CW. I wish I had started CW earlier with a younger, agile mind. But whether the progress is slow or not, I am on this journey anyway. I hope to make slow but steady progress in CW.

Since my small house is in the middle of a crowded city surrounded by high buildings I had no choice but to have remote operation from my office. Otherwise, my HF operation is almost impossible. I am now working in my company as a self-employed state.



At home, I only have TS-480 head unit and remote controller.

Rigs at the office side.

I was given a FISTS number 22497, but I think I am a novice in Ham and CW with many things to learn, including FISTS. Besides Ham, I like bicycle touring, vacuum tube audio DIY, and listening to music.

#### My rig is as below:

6-10-12-15-17-20 m Hexbeam by MW0JZE up 40 ft high.

Telescopic push-up mast from the indoor floor through the roof. Rotator YAESU G800DXA to turn the aluminum mast and Hexbeam. 30-40-80 m Kelemen 3 band trap dipole 30 ft high. RemoteRig RRC-1258 between my house (among high buildings) and my office, which is 25 km apart. Rig KENWOOD TS-480AT. Amplifier SPE 2K-FA.





When I heard about the iambic keying, I got scared and thought that I'd never be able to use that function. So I wanted to use simpler single paddle key. :-) I toyed with various paddle shape and I enjoyed that DIY process. The key mechanism is by RA1AOM.

My Hexbeam.

My salute to the senior Hams of FISTS, and I hope to meet you on the air. For any QSO for mutual training as a CW novice, please reach me at <u>hl5bxw@gmail.com</u>. 73, Chul de HL5BXW

#### A 66 YRS OLD BEGINNER INTO CW - MARU, JJ1LNR, #22498

Hi, in December 2024, I made my first CW QSO.

I am a 66-year-old, semi-retired computer scientist. I received a license for the Phone Class of Ham radio when I was in elementary school. A few years later, I got the Second-Class license, which required me to pass a test in CW sending and receiving at 45 cpm (9 WPM). But that was it for Ham radio. In high school, I came across a digital computer, and I was hooked. After completing my MSc in computer science, I joined IBM Research and worked there for more than a quarter century.

A few years ago, I noticed that a digital mode called FT8 was gaining popularity and decided to give it a try. It was fascinating - I could QSO with stations across Japan and sometimes overseas using my IC-705 and a balcony whip. Then I thought, "Wait, there's a much simpler and more fundamental digital mode: CW." Learning CW at retirement age was certainly a significant challenge, but I believed it would be good for keeping my mental abilities sharp. So, I began practicing Morse code.

From articles in CQ Ham Radio magazine, I discovered a web tool called <u>DitDah Runner</u>. After a couple of years of practice, I became comfortable with receiving 20 WPM random texts. However, I never had the courage to go on the air.

Late last year, I noticed on the A1 Club mailing list that someone was requesting a 23 cm band CW QSO for testing. That person was George, 7J1ATG/1. We scheduled a QSO, and that became my first CW experience. Since then, George has been generously helping me improve my CW skills through weekly sked QSOs.

One thing I've noticed during the learning process is that being able to copy letter by letter is one thing, but understanding the meaning of a message is entirely another. I need to give my full attention to decoding letters, and when I try to focus on the meaning, my attention is divided, and I can no longer decode the letters. Our brains don't

seem to handle two conscious processes in parallel well - I guess I need more practice so I can move towards direct word-to-meaning translation without relying on copying individual letters.

Divided attention is also a challenge in sending. When I have a prepared text in front of me, I can paddle it letter by letter without issues. However, composing a message in my head, translating it into a sequence of letters, and paddling it simultaneously is very difficult. It's probably similar to learning a foreign language, and in hindsight, I should have anticipated this before starting practice.

Equipment-wise, I use a ELECRAFT K2 that I built from a kit, paired with a balcony whip for 40 m operations. The small device in front of the K2 in the photo is a homemade PC interface that allows me to use the paddle and PC keying simultaneously. George taught me the trick of using a tilted mobile whip (see <u>the January issue of morsEAsia</u>), which is truly amazing. His S5 signal jumped to S9 just by tilting the antenna!



I plan to watch FEA NET for now, and once I feel confident in my RX/TX skills, I'll join. I'm looking forward to meeting you all on the air!

# WHERE TO CALL CQ FOR DOMESTIC QSO ON 40 M CW BAND IN JAPAN - TAK, JS1QIZ, #15150

For these one or two years, the frequency of calling CQ for having conversational CW moved toward band edge. From 7020 to 7030 kHz, which had been used for slow conversational chats in English Morse code, is now almost exclusively occupied with Japanese Morse code conversations. From 7015 to 7020, which had been used for Japanese Morse code chat, remains unchanged, but fewer stations QRV here. From 7010 to 7015, which had and has been used for field stations calling CQ for JCC/JCG services, seems to be staying the same. Also, a number of stations call CQ for POTA (Parks on the air) here, pushing JCC/JCG stations toward lower frequencies. From 7005 to 7010, formally used almost

exclusively for DX contacts, is now used for JCC/JCG services and some conversational QSOs in English morse code. Five-Niners (sending only callsign and 599) also call CQ here. Below 7005, it is still a space for DXers, although other frequencies are also used for DX when domestic propagation is dead.

As a member of FISTS, I like conversational English Morse code operation. So, my default choice is around 7008. Some stations leave just after sending UR 599 73, but others enjoy exchanging information. Sometimes, I receive comments on my YouTube channel in the QSO, which is more rewarding for me than having comments as text on YouTube.

See you on the air in the "new area" of the 40 m band. 73



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#### SOTA - TARO, JR0QWW, #5578

It's winter now, but I'm still operating while watching the weather. In mid-February, I climbed a low mountain near my house that is about 327 meters high, together with my wife. There was about a meter of snow in places. It took about an hour and a half to get to the top of the mountain. I set up my tripod and Alexloop antenna and made four contacts on the HF band in CW. The weather was pleasant. Climbing in this season is good because it's not too hot and you don't get attacked by insects. In early March, I introduced a new rig, the KH1. It's a small rig that I can operate by hand. I took it with me to the top of a nearby mountain, where there was still snow. When I transmitted from the summit, I was able to make contact with about six stations in a short time, helped by the good conditions. This year, I will be climbing many mountains with this new rig and activating SOTA.



#### POTA (PARKS ON THE AIR) - SUGI, JK7UST, #7178

I started to challenge to a new operation. It is POTA. POTA means parks on the Air. In Japan, there is a park award. However, POTA is a worldwide activity. POTA has the roles of activator (station that QRV from a park) and hunter (station that works with activator). You can enjoy it in both the role of activator and hunter.

My operating style is to QRV from my car, and the antenna is vertical. Because the antenna is longer than a mobile whip, it seems to work better than a mobile whip. With this kind of equipment, I work with 30 to 50 stations each time. I look forward to meeting you on the air. Thank you,73!



# NEW PROJECTS IN NEW QTH UPDATE - MANABU, JI2MED, #15020

The construction of my tiny house in Shima city, Mie prefecture is going slowly but steadily at the site. I got my old callsign back and submitted an application for high power station.



Meanwhile I QRV from rented house in Shima city with FT-817, 5 watts and inverted V dipole mounted 6 meters high. It works well on 40 m for domestic QSO.



#### OH NO. IT'S BACK? - GEORGE, 7J1ATG / VK4BGR / GW3YTC / JS2PNZ, #15076

Hello - my name is George - I was born in Ireland - I have lived in various Countries before settling in Japan in the early 90's and I hold the Callsigns 7J1ATG / VK4BGR / GW3YTC (G3YTC was my first callsign - obtained in 1968 in the UK) and more recently I was granted a fixed station callsign JS2PNZ. CW is my favourite operating mode.

In the July (2024) Issue (#100) of the FISTS newsletter I told of how my normally S8/9 local QRN noise level at my Yokohama aparto suddenly disappeared ... and at that time of writing my story - and until recently thankfully it had not returned. My Yokohama neighbours had moved out early in 2024 and taken with them whatever it was that was causing the S8/9 QRN on my very limited Yokohama aparto radio system. Since that time I have enjoyed nearly a whole year of amazingly low level QRN (near ZERO on my S-Meter) on 40 / 30 mtrs with signals peaking/exceeding S9 at times and that has allowed me enjoyable use of those bands from my Yokohama aparto - something I could not enjoy previously.

A few weeks ago I had some concerns when I heard the sound of a concrete drill being used on my neighbours balcony ... upon investigation I could see that an outside unit of an aircon system was being installed. My initial thoughts were ... Hmmm I hope it does not cause QRN!

The next day when I turned on my radio - on 40 m - my heart sunk when I saw my normally near ZERO noise level peaking S7! Oh DEAR! - I thought (... but actually different words came from my mouth :-)).

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My neighbour's aircon was on - so over several hours I waited for the neighbour's aircon to be switched off (I could hear the outside unit motor running from my balcony) so that I could confirm the "new" noise was in fact coming from that new aircon - not that I could do anything much about it if that was the case and this situation was very depressing indeed.

Eventually I heard the motor in the neighbour's outside aircon unit stop and upon looking at my RX S-meter there was actually no difference in the noise level displayed - which I thought was a little strange, if it was coming from the new aircon, even if the indoor unit of my neighbour's aircon was the noise source the level should have altered some?

I started asking myself - could the noise source be something else? Could the noise source even be within my home? Thus far - I had assumed it was related to the neighbour's new aircon unit!

As I sometimes do - in cases of unexplained noise appearing on my radio - I awaited a time when my family were out of the house and whilst running my RX on a battery power source I switched off all power to my aparto at the main circuit breaker and "happily" noted that the S7 noise on my RX had gone following that action! I say "happily" as if the noise source was in fact within my aparto I at least have a chance to try and reduce the noise source level.

The next step was to turn off all individual circuit breakers at the main switchboard in my aparto and then, after turning the main circuit breaker back on, turn each individual branch circuit breaker on "one-by-one" in turn and check whether the noise returned on my RX as each branch circuit breaker was turned back on. This method of turning off all power and then restoring "one-by-one" is the easiest method to track sources of noise and I learnt this method, many years ago, in my early years of EMC testing of industrial machines where it was necessary to identify the source of noise from one of 10's or 100's of component parts within the industrial machine so that countermeasures could be carried out to reduce the "over the limit" emission to meet compliance levels.

If the reverse process was used (i.e. just switching off each branch circuit breaker in turn to see if the noise disappeared) in such cases it is possible that multiple noise sources could "mask" another noise source making it harder to track down the source(s).

Following the above recommended process - upon restoring power to one particular section of my aparto I noted the S7 noise level had appeared on my RX S-Meter again. Thankfully - progress was being made!

Armed with a broadband handheld radio (ALINCO DJ-X11 in my case) set to AM mode and fitted with an inline adjustable attenuator in the antenna with the handheld tuned to a 40 m frequency it was easy to pinpoint the noise source by gradually increasing the attenuation as I neared the source.

And the noise source turned out to be ... my daughter's video projector - recently acquired but based on the labelling it should not have been a source of interference ... and clearly it had not been used coinciding with my time on 40 m until that day or I would have noticed it!



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But "based on the labelling" ... I say ... as on the projectors labelling it shows a claim to EMC emission compliance with FCC (USA), RCM (Australia / NZ), CE (Europe) ... I had looked at the labelling when my daughter bought it (being a compliance engineer - I often check safety/EMC labelling on things brought into my home :-) ... don't we all?) and this looked ok - based on the labelling!

But possibly only compliant labelling was the case with this video projector - not EMC compliant emissions? This certainly looks like the case as was indicated when I subjected the video projector to a "basic" EMC emission test.

I want to stress that my basic EMC emission test was not a formal EMC emission test - I could carry out such a formal test if I considered it necessary - but even taking into account the "uncertainty of measurement" of my basic emission test procedure and the parameters of the transducers used / related calculations etc - the video projector is likely to be at least 20 dB over the internationally accepted "residential level" of CLASS B emissions under the IEC / CISPR / FCC / VCCI standards!!





With the video projector switched off and disconnected from the mains supply my RX display looked like:

The yellow trace is the measured EMC emissions with the video projector switched off and disconnected from the mains supply. The green trace is the measured EMC emissions with the video projector powered up and projecting an image onto the wall. Some 45 dB above the yellow trace around the 40 m band! The measurement "Marker 1" is set to 7.042 MHz.

However - all was not lost as with the problem EMC noise source being within my home I at least have some control over it - which would not be the case if it was in my neighbour's home.

I may - if it becomes a major problem try to EMC countermeasure the video projector to bring it into compliance - but for the present time a request to my daughter to check to see if I am "on-air" before using it may be adequate control.

However more of concern is that the video projector has a PSE "non-specified" symbol on the label too. That Japanese PSE symbol is intended to cover not only EMC emissions but electrical safety too!

See brief explanation below:-

# **PSE Scope**

The PSE Law and its regulations specify mandatory electrical safety and EMI requirements for electrical products sold in Japan.

All Electrical Products
Products generally outside
the scope of the PSE Law:
Computers
Dc-input equipment
Special-use equipment
Special-use equipment

457 product categories have been designated pursuant to the PSE Law (as of December 2018).

Under the PSE Law, electrical products are divided into two risk-based categories.

#### Specified Electrical Products

Products with a history of accidents in the marketplace, or products which are likely to cause injury, are termed "Specified Electrical Products" and require third-party assessment by a METI-Registered Conformity Assessment Body (Registered CAB). Specified Electrical Products must display the diamond PSE mark.

#### Non-Specified Electrical Products

Low-risk products are termed "Non-Specified Electrical Products" and are subject to a self-declaration scheme. Non-Specified Electrical Products must be marked with the circle PSE mark.

PS

Products that are non-compliant to EMC requirements can be very annoying to Ham radio operators and can limit our on band activity - but I hope the manufacturer of this product has taken a bit more care in meeting the safety requirements of the non-specified electrical product requirements compared to the EMC requirements - as this type of product only needs a "self-declaration" not the involvement of a 3rd party test house :-( ... under the PSE system!

Careful what you buy! Best 73s to all / George

### A BIT DISAPPOINTING STORY ON OFFICIAL ADDITION OF A NEW TX - TAKESHI, JA4IIJ, #15084

Hello guys! I got YAESU FTDX101MP at the end of 2023 and have been evaluating it as a receiver. This TRX has an incredibly good receiving ability for CW signals with great noise canceling performance owing to APF, DNR, and VC-tune. I am very satisfied. On the other hand, no special advantage was found in the digital operation besides the interface, compared to FT-2000D, which was my main TRX.

In January of this year 2025, the electronic application system for radio amateurs was renewed. In this opportunity I decided to officially apply for the addition of the 101MP as a new TX to operate from 1.8 MHz to 50 MHz. Since I have a 200 W station license, I thought this addition would be quite simple because it is just an official notification of my new TX, but it was not straightforward. This is a bit disappointing story of my application.

I am not sure when it started, but recently, for various applications of fixed radio stations, our government needs the documents confirming that the radiation strength is below the given standard values. That is, you must calculate the electric field strength at your antenna places where people may enter, and the strength should be below the standard value described in the Radio Radiation Protection Guidelines (RRPG). This seemed difficult at first glance, however I had started to fill in the EXCEL form given to check radiation strength at my antenna place. By the way, my antenna is a vertical type (Cushcraft R9, for 3.5 MHz to 50 MHz), which stands in my small garden among trees, as shown in the figure below.

Table below shows the factors needed for this electric field calculation. Although I could enter the geometrical setting of my antenna after measurement, some other terms were not easy to fill. So, I was advised by the local Radio Regulatory Bureau (RRB).



R9 and Ume flowers in full bloom (23 May, 2025)

Factors for Electric Field Intensity Confirmation Table Frequency band (MHz): 1.8/1.9, 3.5, 3.8, 7, 10, 14, 18, 21, 24, 28, 50 Transmitter output P [W] Power line loss [dB] Average power factor [times] Antenna gain G [dBi] Height of transmitting antenna [m] Elevation difference from the place where people usually enter and exit [m] Horizontal distance from directly below the transmitting antenna [m] Distance from the transmitting antenna R [m] Whether or not ground reflection is taken into consideration Correction coefficient K for ground reflection [times] Whether or not there is strong reflection from nearby buildings Correction due to strong reflection from nearby buildings [times] Calculated electric field strength E [V/m] Reference value [V/m] (MHz): 275(1.8/1.9), 223(3.5), 216(3.8), 114(7), 81.1(10), 57.4(14), 45.3(18), 38.4(21), 32.9(24), 27.7(28), 27.5 (50)

At first, I did not know the gain of R9. The catalog value is 3 dBi, but this number must be the gain at high frequencies without shortening. I do not think that number is appropriate for 3.5 or 7 MHz, however I was advised to use 3 dBi for all bands by the RRB. This advice is obvious because the calculated electric field strength using 3 dBi is enough smaller than the regulation values at low frequencies.

The "average power factor" probably has the greatest impact on the results of the assessment: The given explanation suggests that the factor is 0.5 when the emission type is A1A, and it is 0.16 for J3E. For digital modes such as FT8, it should be 1. If you operate multiple modes, the factor must be the largest one. In my case, FT8 operation is required on all frequencies from 1.8 to 50 MHz. So, I must set the factor to 1.

At my antenna place, the 200 W operation is OK (the power factor is 1) for 18 MHz or less. However, for the 21, 24, 28, and 50 MHz bands, the calculated output to satisfy the regulation is 196, 144, 102, and 105 W, respectively. Since I was not sure how to deal with this issue, I was advised again by RRB. The advice given was that "adjust your operation so that it falls within the standard reference value". For example, you should add remarks to the EXCEL form something like "operate at 100 W or less on the xx MHz band when digital mode is used" or "do not operate in digital mode on any band".

Finally, I understood that I cannot operate the new TRX at full power at high bands. Although this is not a problem for those who have enough space around the antenna, I learned that the allowed output power was no longer determined by the license class. Moving the antenna to the end of my garden may be OK, but the other issue of guying arises. A bit disappointing, but safety first, of course. I should enjoy the rest of my radio life with the present circumstances. Using TeamViewer for in-house remote-controlling my rigs while doing odd jobs is very convenient and suits my lifestyle. Thank you, guys, for reading. HPE CU SN!

#### FEA CW NET RESULTS: NO. 1046 TO 1058 - NAO, JO3HPM, #15008

No.	Part	Date	Start	End	Freq.	Controller	Participants
		(Y/M/D)	Time (UTC)	Time (UTC)	(MHz)		
1058	2	2025/03/30	08:00	08:21	14.054	JL3YMV	VK4BGR, VK6RR, JJ1FXF
1058	1	2025/03/29	23:00	23:57	7.026	JA4IIJ	JO3HPM, JR0OWW, JS2PNZ, JS1QIZ, JJ1FXF
1057	2	2025/03/23	08:00	08:33	14.054	JL1GEL	JK7UST, VK4BGR, JO3HPM, JS2AHG, JA4IIJ, JA4MRL
1057	1	2025/03/22	23:00	00:16	7.0265	JS1QIZ	JE1TRV, JL1GEL, JR0QWW/0, JS2PNZ, JO3HPM, JI2MED, JJ1FXF,
							JA4IIJ, JK1QYL, JA4MRL, JG1BGT
1056	2	2025/03/16	08:00	08:41	14.054	JE7YTQ	VK4BGR, JL1GEL, JS2AHG, JO3HPM, VK6RR, JA4IIJ, JI2MED
1056	1	2025/03/15	23:00	00:04	7.0255	JL3YMV	JE1TRV, JL1GEL, JI2MED, JA4MRL, JS2PNZ, JS1QIZ, JJ1FXF,
							JK1QYL, JA4IIJ, JF3KNW, JG1BGT
1055	2	2025/03/09	08:00	08:41	14.054	JE7YTQ	VK4BGR, JO3HPM, JA4IIJ, JS2AHG, JL1GEL
1055	1	2025/03/08	23:00	00:07	7.026	JA4IIJ	JE1TRV, JS2PNZ, JL1GEL, JS1QIZ, JO3HPM, JI2MED, JJ1FXF,
							JK1QYL
1054	2	2025/03/02	08:00	08:32	14.054	JL1GEL	JS2AHG, VK6RR, VK4BGR, JA4IIJ, JO3HPM
1054	1	2025/03/01	23:00	00:00	7.0255	JS1QIZ	JI2MED, JS2PNZ, JE1TRV, JL1GEL, JO3HPM, JJ1FXF, JA4IIJ,
							JK1QYL
1053	2	2025/02/23	08:00	08:22	14.054	JL3YMV	VK4BGR, JS2AHG, VK6RR
1053	1	2025/02/22	23:00	00:13	7.0265	JL1GEL	JS1QIZ, JI2MED, JS2PNZ, JO3HPM, JE1TRV, JA4IIJ, JK1QYL,
							JJIFXF, JA4MRL
1052	2	2025/02/16	08:00	08:25	14.054	JL3YMV	VK6RR, VK4BGR, JL1GEL, JS2AHG
1052	I	2025/02/15	23:00	00:01	7.026	JA411J	JSTQIZ, JETRZR/2, JLTGEL, JS2PNZ, JETTRV, JO3HPM, JR0QWW/0
1051	2	2025/02/09	08:00	08:42	14.054	JL1GEL	JK7UST, JO3HPM, VK6RR, ZL1NZ, JS2AHG, HL1MIM
1051	1	2025/02/08	23:00	00:09	7.028	JE7YTQ	JS1QIZ, JE1TRV, JE1RZR/2, JO3HPM, JS2PNZ, JA4MRL, JK1QYL,
							JA4IIJ
1050	2	2025/02/02	08:00	08:48	14.054	JE7YTQ	VK6RR, VK4BGR, JS1AHG, JO3HPM, JJ1FXF, JA4MRL, JH2HTQ
1050	1	2025/02/01	23:00	00:10	7.0265	JS1QIZ	JA4MRL, JK1QYL, JO3HPM, 7J1ATG/1, JE1TRV, JL1GEL, JJ1FXF,
							JA4IIJ, HL5BXW, JG1BGT
1049	2	2025/01/26	08:00	08:30	14.054	JL3YMV	VK4NGR, JS1AHG, JK7UST
1049	1	2025/01/25	23:00	00:15	7.026	JA4IIJ	JS2AHG, 7J1ATG/2, JK7UST/1, JS1QIZ, JR0QWW, JE1RZR/2,
							JO3HPM, JK1QYL, JJ1FXF
1048	2	2025/01/19	08:00	08:35	14.054	JL3YMV	JK7UST, VK4BGR, VK6RR, JS2AHG
1048	1	2025/01/18	23:00	23:55	7.028	JS1QIZ	7J1ATG/2, JO3HPM, JE1RZR/2, JJ1FXF, JS2AHG, JL1GEL,
							JK1QYL
1047	2	2025/01/12	08:00	08:55	14.054	JE/YIQ	VK6RR, JO3HPM, JS2AHG, JL1GEL, JJ1FXF, VK3DBD/ZL
1047	I	2025/01/11	23:00	00:06	7.0265	JL3YMV	JSIQIZ, /JIATG/I, JK/UST, JEIRZR/2.JS2AHG, JR0QWW, IK1OVI IA4III IIIEXE IA4MRI IEITPV
1046	2	2025/01/05	08.00	08.37	14 054	IL1GEI	IK7UST VK4BGR VK6RR IO3HPM IS2AHG II1FYF
1046	- 1	2025/01/03	23.00	00.07	7 0255		ISIOIZ ISZAHG IIIEXE II IGEL ZILATG/2//1) IO2UDM
1040	1	2023/01/04	25.00	00.09	1.0255	J/ <b>\</b> +11J	JK1QYL, JE1RZR/1

#### FINALE

Can you believe that some young people these days have never seen a radio receiver? On 22 March 2025, it was the 100th anniversary of radio broadcasting in Japan. The first program was broadcasted with the callsign JOAK, frequency 375 m (800 kHz), mode AM, and power 220 W from Tokyo. In the 100th anniversary news, such young people story was reported. With the spread of the Internet, the number of radio listeners has been decreasing. Nowadays, more and more people are getting news not from old media such as radio, but from social media. In addition, most radio programs are also broadcasted on the Internet simultaneously. It seems that modern radio listeners use smartphones rather than radio receivers. MF (Medium Frequency), AM broadcasting in Japan is now in danger of extinction. Most MF, AM stations are scheduled to move to VHF (Very High Frequency), FM stations by autumn 2028. One of the reason is that it costs to maintain big antennas with over 100 m height and related system to transmit MF radio waves. Despite the difficult trend, I believe without a doubt that radio will never end. Of course amateur radio too. I pray for a peaceful world. 73/88 and stay sober de Nao.