

English transcript of the review from the Japanese RADIOLIFE magazine edition 2019/03, published by SANSAI BOOKS LTD.

AR-DV1

The recent firmware update is significant!
Now we can listen to TETRA in our country. This is nice!

The AR-DV1 firmware had not been updated for quite some time.
The new firmware 1812A BETA, released on December 21, 2018, allows reception of TETRA! But wait a minute. But one would think, wasn't this already possible with version 1609D? Indeed, with 1609D which was released on September 29, 2016, AR-DV1 implemented the Tetra Direct mode (this demodulation mode appears in the selection menu as "T-DM"). However, domestically, this did not mean that we were able to listen to Tetra signals. As far as I know, no one was using the Tetra "direct mode" here, so I had given up decoding Tetra at that time.
But with "1812A" everything changes! It enables trouble free voice decoding of the "Digital mobile communication system TYPE 2", as used in some airports. In addition to the previously implemented Tetra Direct mode (T-DM), firmware 1812A also allows decoding of Tetra's Traffic Channels (T-TC mode) of trunked networks.

However, it is not yet a full trunking support (which implies tracking of a specific user group/ID) at this time. It simply automatically determines and receives the slot where a call currently occurs.

This is probably why the mode has been named "Tetra Traffic Channel", and it's probably also the reason why this firmware has been labeled "beta". Still, I can barely hide my excitement to the fact that we can now listen to Tetra in Japan!

The reception operation is very easy. Here (in Tokyo) the "T-TC" mode decodes signals of the "Airport Digital Mobile Communication System" which uses frequencies between 460.00000 and 462.00000 MHz. A search between those frequencies, with a 25kHz step, finds out the carriers and the slot where there is an ongoing call, and that audio can be heard.

The thing to pay attention to is to set the squelch to LSQ (level squelch) in T-TC mode for best performance. If however you want to use NSQ (noise squelch), make sure you don't forget to adjust the squelch level. Level 0 should be fine. In addition, because the downlinks of the Tetra system are continuous carriers, the search done in NSQ is not going to be very fast, about 1 channel per second. (AOR comment: LSQ is set by default to avoid confusion and for faster performance. It's actually very fast if you have strong signals.)

It is also possible to do a scan of a memory bank programmed with all carriers (frequencies) of the trunked network.

Scan and search speeds are the same, however scan will be more time efficient as you can exclude channels without active carriers.

Out of a maximum of four active audio slots per carrier, the slot with an ongoing call is automatically selected and decoded. That is the basic function of the "T-TC" mode. I noticed that the receiver has a tendency to prioritize the audio slot with the highest number. For example, let's say the receiver is outputting the audio of slot 2, if a new call appears on slot 4, it will switch to the call on slot 4. (AOR comment: squelch behavior can be adjusted in settings) Here, like for the slot selection in the DMR mode, it might be interesting to be able to manually set a priority between the slots. However in DMR there are only 2 slots to prioritize, doing that manually with 4 Tetra slots might be tricky...

AR-DV1 allows to arbitrarily select the slot to be received, (press main dial and rotate) but that is currently only possible while the carrier is being received. It would be nice to be able to set this beforehand.

This being said, the implementation of CELP codec (ACELP) in software, and being able to actually output audio is a terrific thing, and AR-DV1 is a perfect example of the continuous evolution of digital receivers.

Trunking is a feature that is nice to have, but honestly, I have no idea whether the future of radio communications will be entirely based on that in the future. So I'll be looking forward to see into what direction the future will go.

By the way, the "digital mobile communication system TYPE 2" for airports has been implemented for the first time in 2016 at NARITA AIRPORT, followed by NAHA AIRPORT in 2017. Both airports have now completely switched to this new system. Next on the list is CHUBU (NAGOYA) AIRPORT in July 2019. In addition to that, Tokyo's HANEDA AIRPORT is apparently currently setting up such a communications service. (In January 2019) We have been able to confirm that 7 out of the 25 carriers are currently used for Tetra communications. Those communications can be decoded by the AR-DV1 in T-TC mode.

I look forward to enjoy a rich variety of calls like in Narita, after the service is fully setup, in 2 years maybe.

Finally, I think that the "T-TC" mode should also be able to decode the "Prefecture and municipal digital mobile communication system TYPE2 (Arib STD-T80)" but only few municipalities have adopted this standard, so signals are rare.

If someone is able to receive and decode such a signal, please let me know! Please monitor the 270 MHz band in your area thoroughly.