

ACOUSTIC CONTROL COMMAND TRANSMISSION SYSTEM ON UNDERWATER VEHICLES USING BARKER SEQUENCES

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The article considers a variant of the underwater communication system using phase-manipulated signals in the form of a 13-position Barker sequence. The system was developed in the Department of Technical Means of Ocean Research at the Pacific Oceanological Institute Far Eastern Branch of the Russian Academy of Sciences. The results of a model experiment on the joint application of signals based on Barker sequences with different carrier frequencies are discussed. A method of separating these signals is proposed to ensure reliable transmission of control commands to underwater vehicles (underwater objects).

Keywords: hydroacoustics, pseudorandom signals, underwater communication.

References

1. Akulichev V.A., Kamenev S.I., Morgunov Ju.N. Primenenie slozhnykh akusticheskikh signalov v sistemakh svyazi i upravleniya podvodnymi ob'ektami // Doklady AN. 2009. Vol. 426, No. 6. P. 821–823. [In Russ.]
2. Bezotvetnykh V.V., Burenin A.V., Morgunov Ju.N., Polovinka Ju.A. Jeksperimental'nye issledovaniya osobennostej rasprostraneniya impul'snykh signalov iz shel'fa v glubokoe more // Akusticheskij zhurnal. 2009. Vol. 55, No. 3. P. 374–380. [In Russ.]
3. Zaharov Ju.V., Kodanov V.P. Jeksperimental'noe issledovanie akusticheskoy sistemy peredachi informatsii s shumopodobnymi signalami // Akusticheskij zhurnal. 1994. Vol. 40, No. 5. P. 799–808. [In Russ.]
4. Kamenev S.I. Jeksperimental'nye issledovaniya harakteristik slozhnykh fazomanipulirovannykh akusticheskikh signalov na stacionarnykh trassakh razlichnoj protjazhennosti // Podvodnye issledovaniya i robototekhnika. 2007. No. 2(4). P. 46–52. [In Russ.]
5. Kamenev S.I. Virtual'naya gidroakusticheskaya sistema obrashheniya vremeni // Podvodnye issledovaniya i robototekhnika. 2010. No. 1(9). P. 47–52. [In Russ.]
6. Chepurin Ju.A., Gavrilov A.N. Peredacha dannykh po podvodnomu akusticheskomu kanalu: analiz dannykh jeksperimenta ACOUS // Doklady 10-j shkoly-seminara akad. L.M. Brehovskih. M.: GEOS, 2004. P. 222–225. [In Russ.]
7. Catipovic J.A. Performance limitation in underwater acoustic telemetry // IEEE J. Oceanic Engineering. 1990. V. OE-15, No. 3. P. 205–216.
8. Bezotvetnykh V.V., Kamenev S.I., Morgunov Ju.N., Burenin A.V. Sistema zvukopodvodnoj svyazi s ispol'zovaniem slozhnykh fazomanipulirovannykh signalov i obrashheniya vremeni // Podvodnye issledovaniya i robototekhnika. 2014. No. 2 (18). P. 58–63. [In Russ.]
9. Kamenev S.I. Signaly s uluchshennymi harakteristikami na osnove posledovatel'nostej Barkera dlja primeneniya v akusticheskikh sistemah // Podvodnye issledovaniya i robototekhnika. 2014. No. 2 (18). P. 63–68. [In Russ.]

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