

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 October 2008 (23.10.2008)

PCT

(10) International Publication Number
WO 2008/128081 A1

(51) International Patent Classification:
G01S 3/02 (2006.01)

(74) Agents: **SUEOKA, Greg, T.** et al.; Fenwick & West LLP,
Silicon Valley Center, 801 California Street, Mountain
View, CA 94041 (US).

(21) International Application Number:
PCT/US2008/060084

(22) International Filing Date: 11 April 2008 (11.04.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/735,158 13 April 2007 (13.04.2007) US

(71) Applicant (for all designated States except US):
GLOWLINK COMMUNICATIONS TECHNOLOGY, INC. [US/US]; 333 Distel Circle, Los Altos, CA 94022 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HO, Dominic, K.C.** [US/US]; c/o Glowlink Communications Technology, Inc., 333 Distel Circle, Los Altos, CA 94022 (US). **CHU, Jeffrey, C.** [US/US]; c/o Glowlink Communications Technology, Inc., 333 Distel Circle, Los Altos, CA 94022 (US). **DOWNEY, Michael, L.** [US/US]; c/o Glowlink Communications Technology, Inc., 333 Distel Circle, Los Altos, CA 94022 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

(54) Title: DETERMINING A GEOLOCATION SOLUTION OF AN EMITTER ON EARTH BASED ON WEIGHTED LEAST-SQUARES ESTIMATION

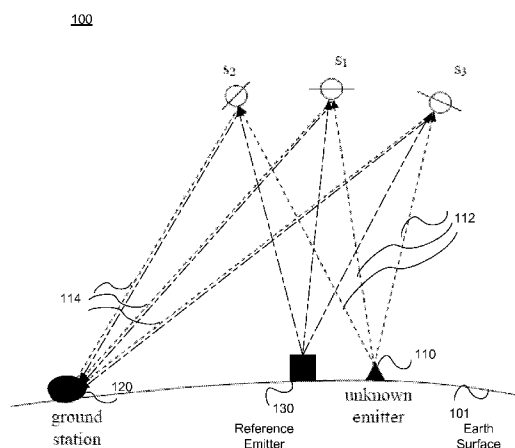


FIG. 1

(57) Abstract: Embodiments provide systems and methods for determining the geolocation of an emitter on earth based on weighted least-squares estimation based on two TDOA and two FDOA measurements, none of which need to be acquired at the same time. The four TDOA and FDOA measurements and the errors in each of the measurements are determined. Weights for the errors in the TDOA and FDOA measurements are determined, and the weights are applied in a weighted errors function. The weights account for the errors in the measurements and the errors in the satellite positions and velocities, and are dependent on the localization geometry. The weighted errors function is minimized to determine the location estimate of the unknown emitter.

WO 2008/128081 A1