

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 July 2009 (09.07.2009)

PCT

(10) International Publication Number
WO 2009/083961 A9

(51) International Patent Classification:
H01Q 3/26 (2006.01) **G01S 7/40** (2006.01)

(21) International Application Number:
PCT/IL2008/001661

(22) International Filing Date:
24 December 2008 (24.12.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
188507 31 December 2007 (31.12.2007) IL

(71) Applicant (for all designated States except US): **ELTA SYSTEMS LTD** [IL/IL]; 100 Yitzhak Hanassi Blvd., P.O.B. 330, 77102 Ashdod (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LOMES, Alexander** [IL/IL]; 753 Nachal Poleg, 71908 Maccabim (IL). **VAGMAN, Yacov** [IL/IL]; 12/63 Israel Galili Street, 75426 Rishon Lezion (IL). **REICHMAN, Haim** [IL/IL]; 27 Ela Street, 76804 Mazkeret Batia (IL).

(74) Agent: **REINHOLD COHN AND PARTNERS**; P.O.B. 13239, 61131 Tel Aviv (IL).

(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, ST, 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 (Art. 21(3))

[Continued on next page]

(54) Title: PHASED ARRAY ANTENNA HAVING INTEGRAL CALIBRATION NETWORK AND METHOD FOR MEASURING CALIBRATION RATIO THEREOF

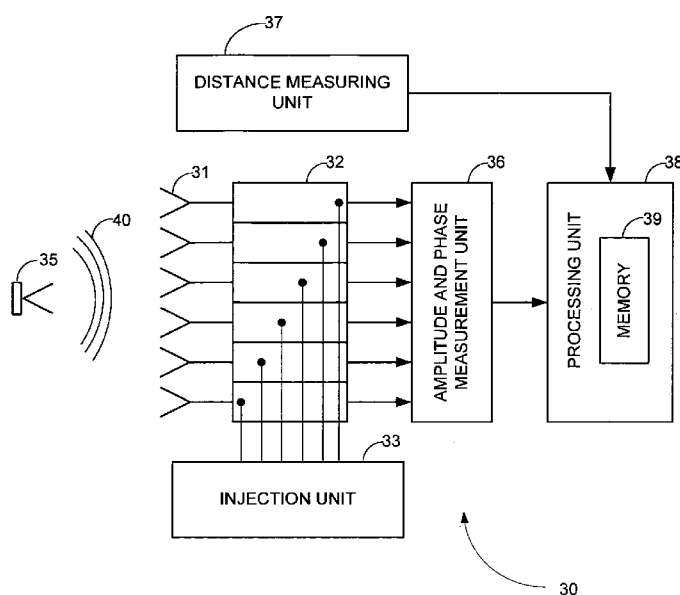


FIG. 2

(57) Abstract: A phased antenna arrangement and a method for estimating the calibration ratio of an active phased antenna having a plurality of phased array antenna elements are described. The phased antenna arrangement includes a plurality of antenna elements, a plurality of receiving channels, an injection unit for injection of calibrating signals into the receiving channels, a point RF-source, located in a far field zone, a distance measurement unit, an amplitude and phase measurement unit and a data processing unit. The method comprises injecting an internal calibrating signal having a known amplitude and phase to each antenna element. An external calibration signal from a stationary RF-source is sequentially injected to all of the phased array antenna elements so that different phases of the external calibration signal arrive at each of the antenna elements. The differences in phases of the external calibration signal reaching the antenna elements are compensated so as compute an effective signal amplitude that would reach all of the antenna elements at zero phase difference. Calibration ratio is calculated as the ratio between the amplitude of the internal calibrating signal to the effective signal amplitude of the external calibration signal.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(15) Information about Correction:
see Notice of 27 August 2009

(88) Date of publication of the revised international search report:

27 August 2009