



- (51) **International Patent Classification:**
G01S 13/75 (2006.01)
- (21) **International Application Number:**
PCT/IL2013/050619
- (22) **International Filing Date:**
22 July 2013 (22.07.2013)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
221162 29 July 2012 (29.07.2012) IL
- (71) **Applicant:** ELTA SYSTEMS LTD. [IL/IL]; 100 Yitzhak Hanassi Blvd., P.O.B. 330, 7710201 Ashdod (IL).
- (72) **Inventor:** FIREAIZEN, Moshe; Neve Zuff, 7194500 Halamish (IL).
- (74) **Agent:** REINHOLD COHN AND PARTNERS; P.O.Box 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, BN, BR, BW, BY,

BZ, CA, CH, CL, 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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

(54) **Title:** TRANSPONDER DEVICE

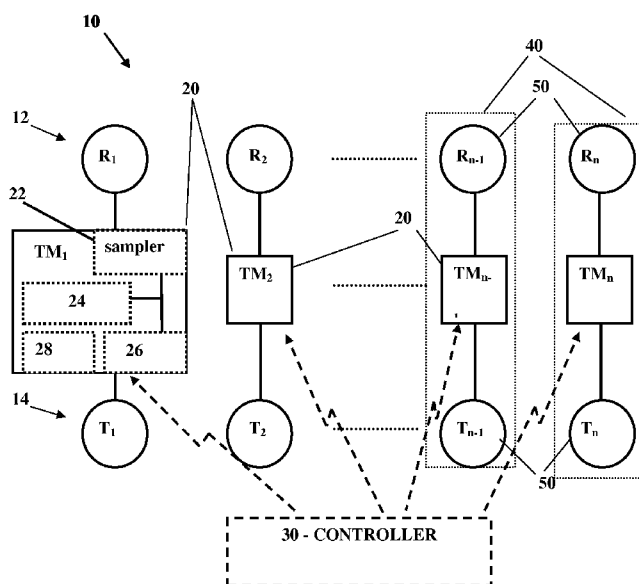


FIG. 1

(57) **Abstract:** A transponder system including first and second arrays of receiving and transmitting antenna elements arranged in spaced apart relationship with a predetermined spacing. The antenna elements of the first array are connected, via respective transmission modules, to respective antenna elements of the second array in accordance with their positions in the arrays thus forming receiving and transmitting pairs of antenna elements, which are operable together to receive an input signal and transmit a collective output signal that is indicative of the received input signal. The transmission modules include: a sampler adapted for digitizing signals received by the receiving antenna element of the corresponding pair, a memory connectable to the sampler for storing digital representation of the received signals, and a signal generation module connectable to the memory and operable for generating from the digital representation a signal to be transmitted by the transmitting antenna element of the corresponding pair. The signal generation module is operable for introducing a predetermined temporal delay to the signal to be transmitted with respect to the received signal to thereby provide a predetermined angular shift between a waveform of the received input signal and a waveform of the collective output signal.