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(21) International Application Number: PCT/US96/15884 (22) International Filing Date: 3 October 1996 (03.10.96) (30) Priority Data: 538,562 3 October 1995 (03.10.95) US (71) Applicant: QUALCOMM INCORPORATED [US/US]; 6455 Lusk Boulevard, San Diego, Ca 92121 (US). (72) Inventors: KULBERG, Eric, C.; 1043 Sapphire Street #1, San Diego, CA 92109 (US). TIDWELL, Stephen, B.; 3280 Maezel Lane, Carlsbad, CA 92008 (US). DAVIS, Roy, H.; 7450 Keisha Terrace, San Diego, CA 92126 (US). FISCHER, Roy, K.; 12646 N. 56th Place, Scottsdale, AZ 85254 (US). TOLTZMAN, Randall, R.; 14681 N. 97th Place, Scottsdale, AZ 85260 (US). BROWN, Ransom, A.; 2013 N. 66th Street, Scottsdale, AZ 85257 (US). (74) Agents: MILLER, Russell, B. et al.; Qualcomm Incorporated, 6455 Lusk Boulevard, San Diego, CA 92121 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MR, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: MULTI-AXIS VERTICALLY CORRECTED ANTENNA FOR HANDHELD WIRELESS COMMUNICATIONS DEVICES		
(57) Abstract A portable wireless communications device such as a telephone handset (10, 110) having a vertically corrected antenna module (34, 134) pivotally secured to the handset (10, 110) for rotation about a first pivot axis (40, 140). The antenna module (34, 134) can be rotated into a predetermined orientation, independent of handset orientation. An antenna (24, 124) mounted on the module (34, 134) is oriented vertically when the module (34, 134) is in the predetermined orientation. When the antenna module (34, 134) is rotated for use, a mechanism incorporated in the module (34, 134) support structure automatically rotates the antenna module (34, 134) about a second pivot axis (190) which is substantially perpendicular to the first (40, 140). This second rotation places the antenna (24, 124) at an angle that compensates for tilting of the handset (10, 110) during use about an axis parallel to the second axis (190), or along the first (40, 140). That is, the antenna (24, 124) is shifted by a preselected angle in vertical orientation, typically around 10-15 degrees, in a direction perpendicular to the first direction of rotation to compensate for positioning a speaker and microphone (26, 28) for use.		