

**DUAL POLARIZED FLAT ARRAY
WITH HIGH ISOLATION FOR DBS**

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The individual microstrip dual polarized radiating source has already been described [1], [2]. It is composed of two orthogonal flat folded dipoles. In our new model (fig. 1), each of them is fed by two completely isolated transmission lines [3]. One is a strip-line T and the other a microstrip-line M which are separated by a conducting plane R. The source is composed of three compact printed circuits as indicated. The radiating source is printed in R and is separated from the whole metallic plane by four dielectric slots S_1, S_2, S_3, S_4 . Each feeding line is opened at its end and coupled with the corresponding folded dipole by means of a quarter-wavelength ℓ_1 or ℓ_2 . For an array of four identical radiating sources with $H_1 = H_2 = H_3 = 0.8$ mm, $\epsilon_r = 2.2$, $w_1 = 0.68$ mm, $w_2 = 0.3$ mm, $\ell_1 = 4.5$ mm, $\ell_2 = 3.55$ mm, located following a square arrangement, we measured the V.S.W.R. (fig. 2 and 3) which was lower than 1.5 in the D.B.S. frequency range (11.7 to 12.1 GHz). The coupling between the two accesses of each source is lower than -30 dB between 11.85 to 12.2 GHz. (Fig. 4).

The whole array is composed of 32 resonant subarrays associated with two special feeding structures [4]. Every subarray supports 10 sources separated by 17 mm which is the wavelength for the strip-line feeding arrangement at the mean frequency 11.9 GHz. Two subarrays have been manufactured and tested. The first in fig. 5 is related to a microstrip feeding arrangement and the other in fig. 6 is for the strip-line one. The V.S.W.R. related to a characteristic resistance of 100 ohms remains lower than 1.85 between 11.8 and 12.2 GHz for the two different accesses of each subarray. In the next table we present in "E plane" the 3 dB beamwidth θ_{3dB} , the low side lobe level L(dB) related to one subarray pattern, and the isolation between two among them in "H plane".

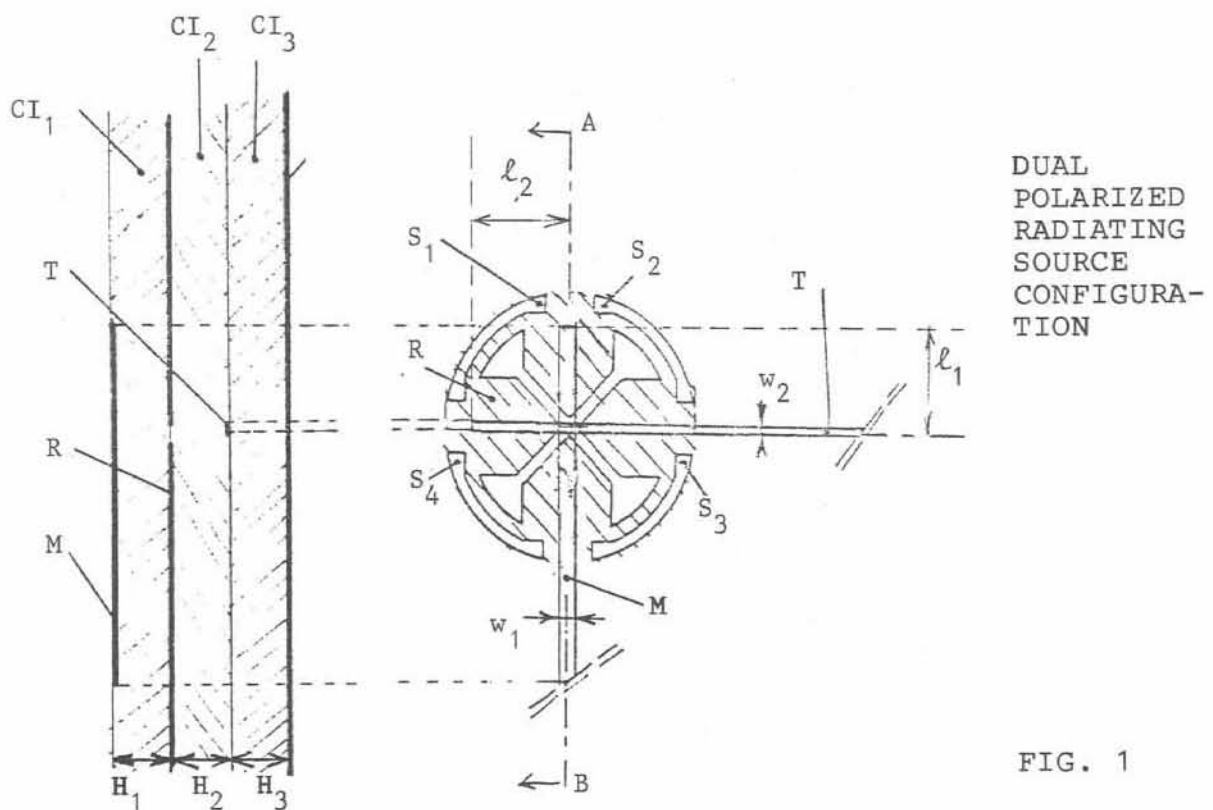
f(GHz)		11.75	11.8	12.0	12.1	12.2
θ_{3dB} (degrees)		8.0	9.0	10.0	10.5	11.5
L(dB)		-13	-21	-19	-18	-19
Isolation between	Two subarrays in in H plane	-44	-48	-42	-39	-37
	Two accesses of one subarray	-33	-35	-37	-32	-29

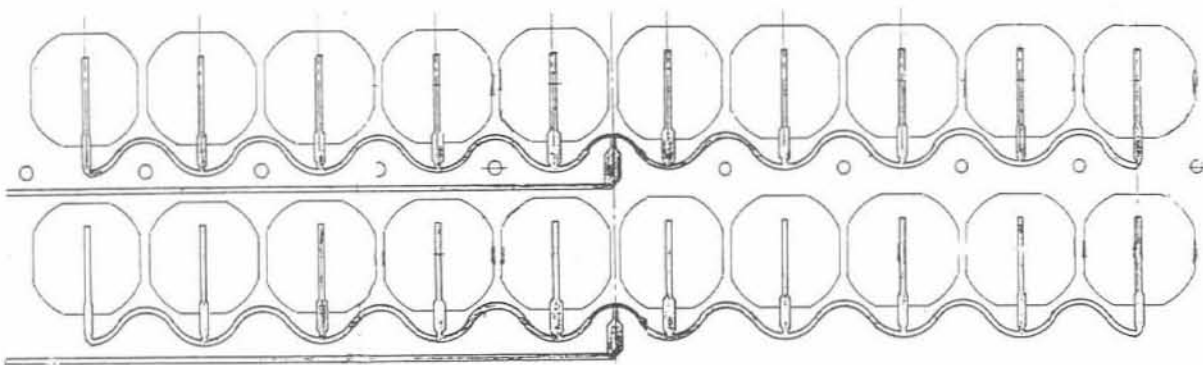
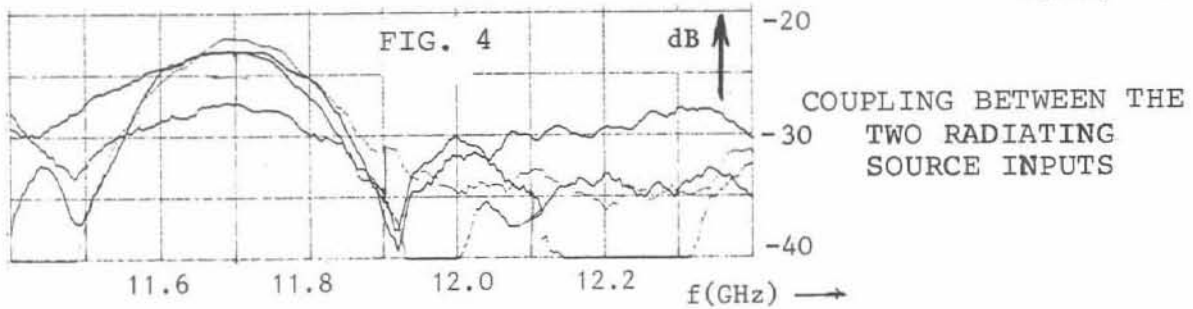
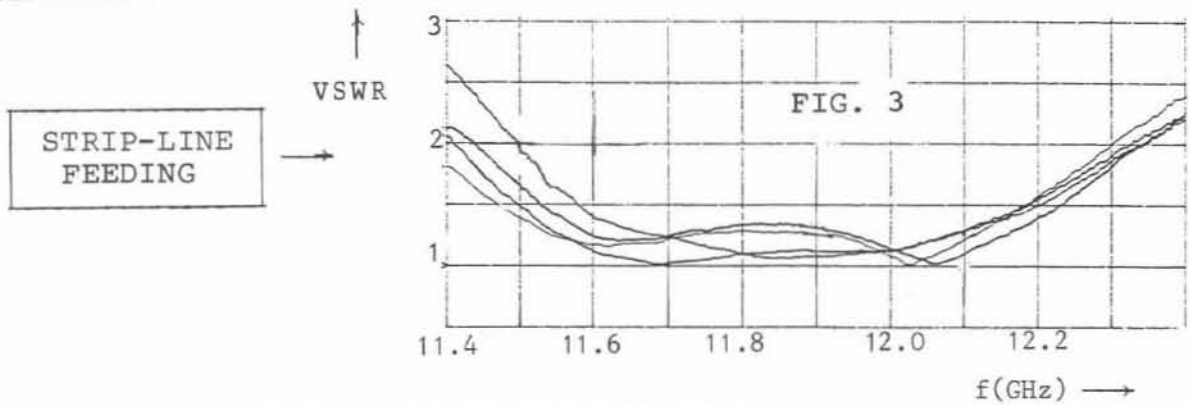
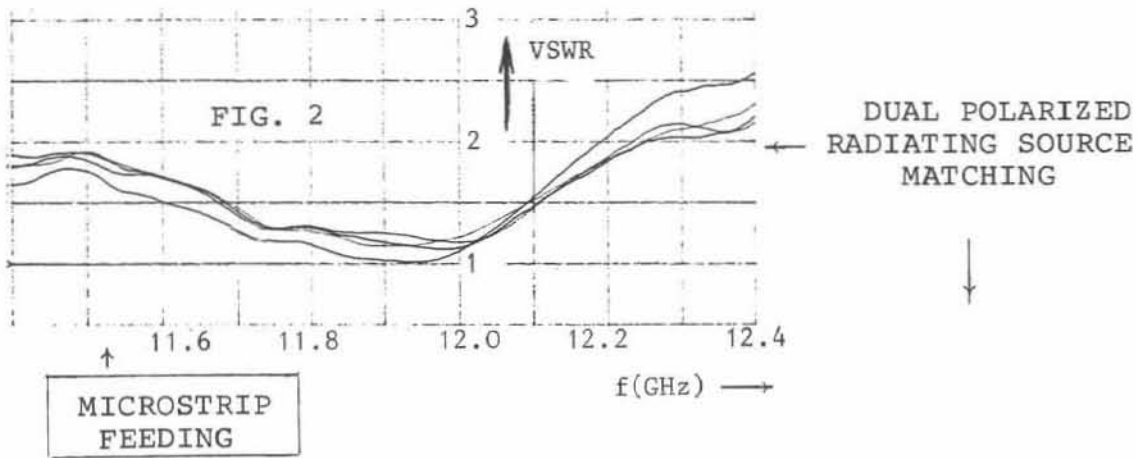
In Fig. 7 we present the patterns related to a strip-line feeding arrangement (fig. 6). The crossed polarized level (C.P) in "E plane" is lower than -25 dB.

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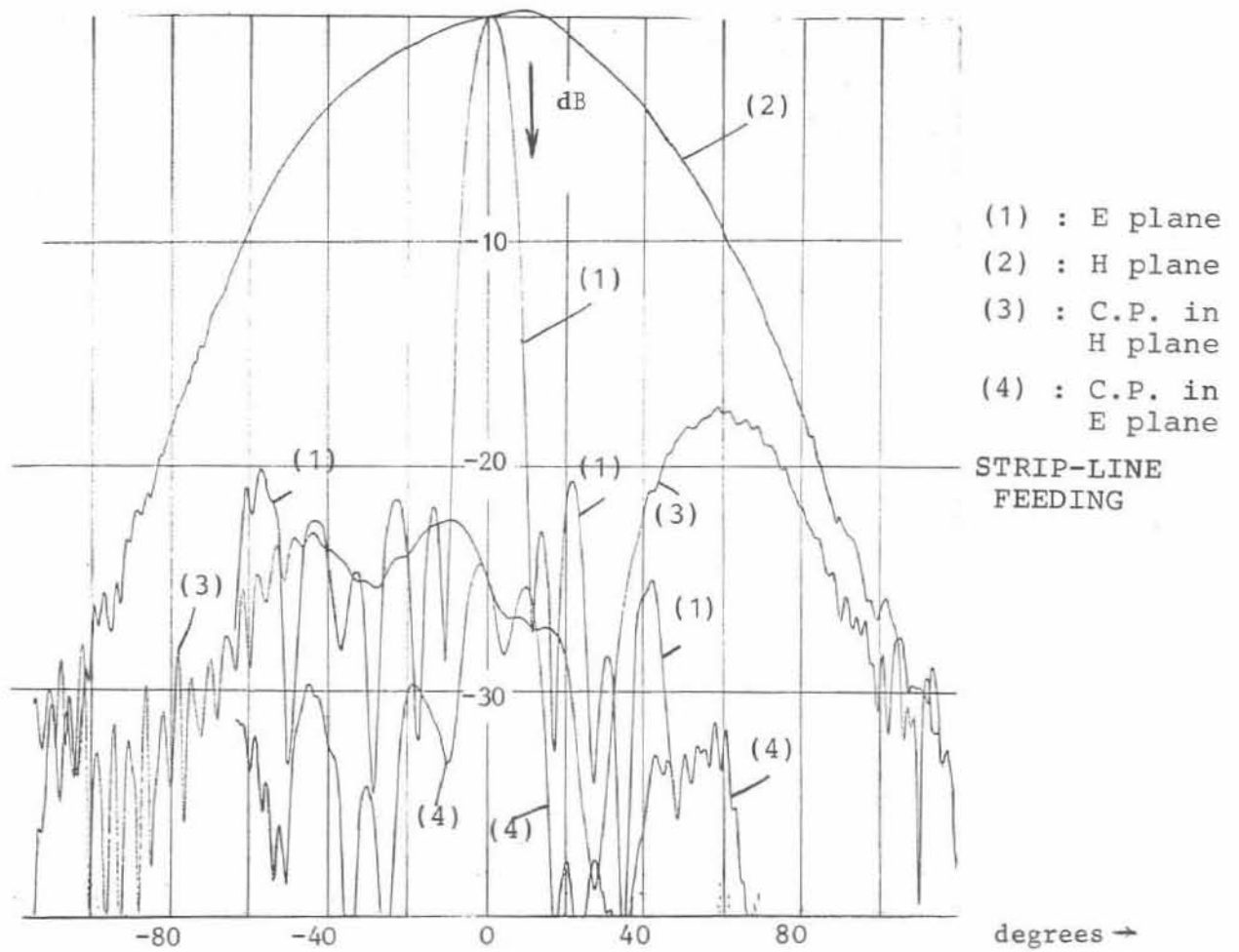
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- [3] **G. DUBOST, R. FRIN, G. BASTARD, M. LOISEAU :**
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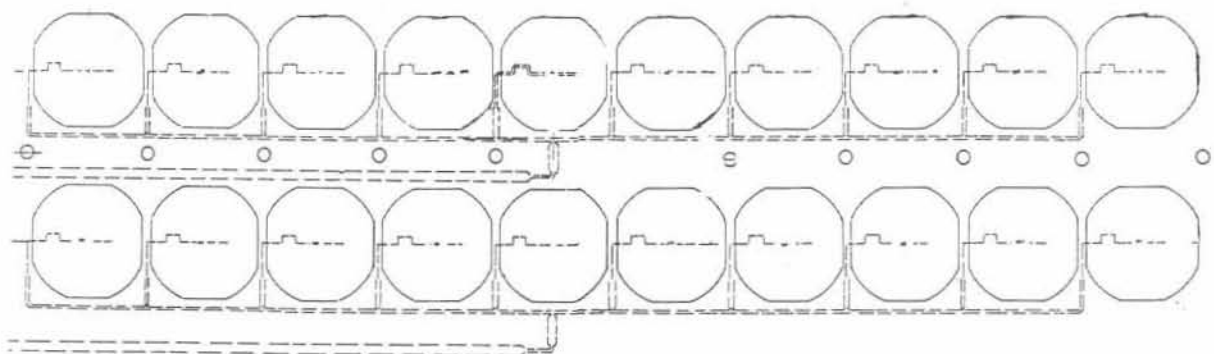
MICROSTRIP FEEDING ARRANGEMENT FOR TWO SUBARRAYS ACTING AT RESONANCE.

FIG. 5



MEASURED RADIATION PATTERNS OF ONE SUBARRAY AT 11.8 GHz

FIG. 7



STRIP-LINE FEEDING ARRANGEMENT FOR TWO SUBARRAYS ACTING AT RESONANCE

FIG. 6