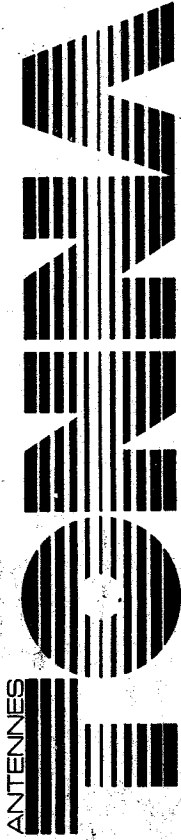
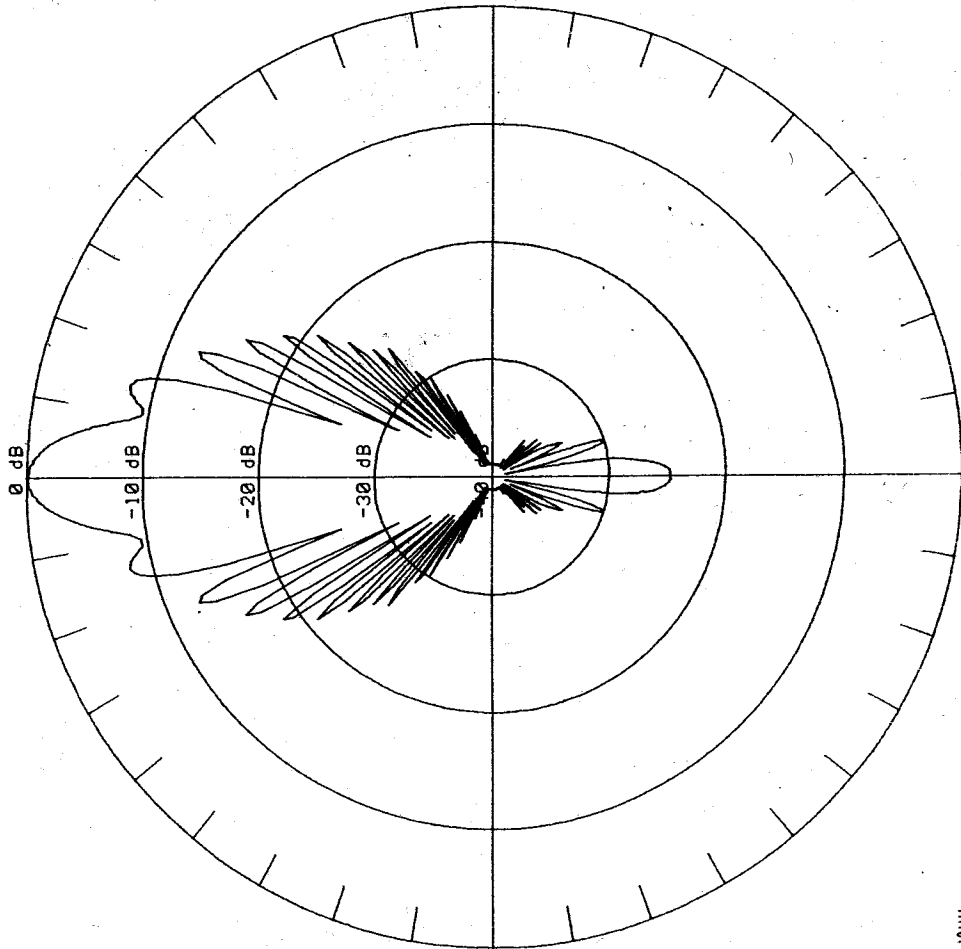


DIAGRAMME DE RAYONNEMENT CALCULE: ANTENNE 55 ELEMENTS LONG YAGI

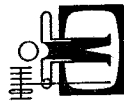
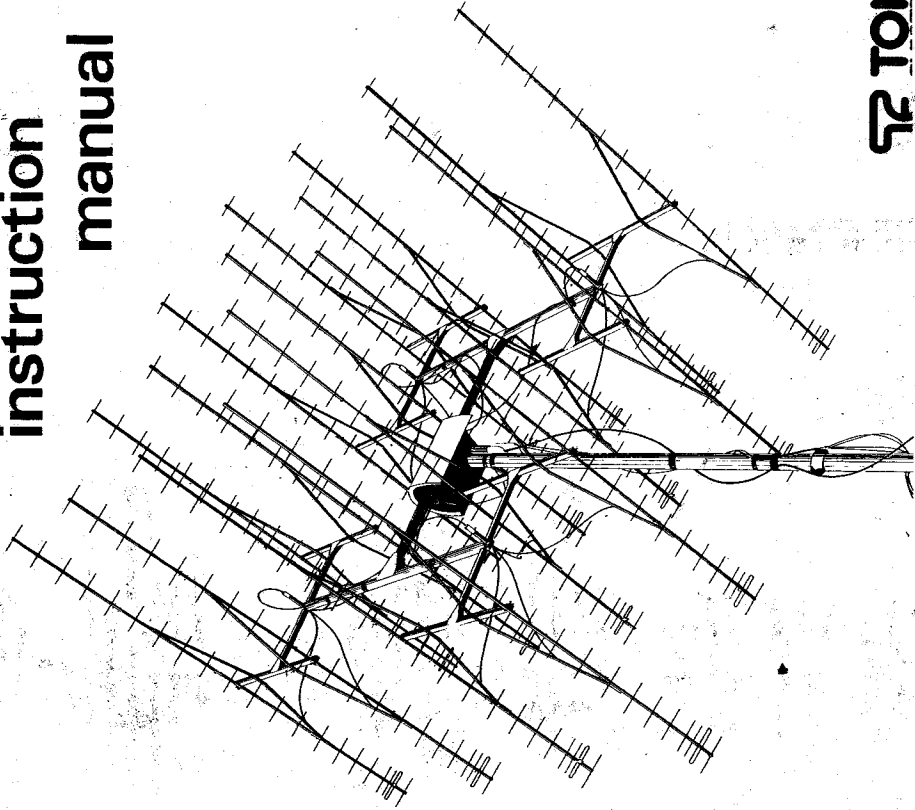
FREQUENCE: 1296.0 MHz PLAN: E

GAIN CALCULE : 21.25 dB Iso RAPPORT AU ARR.: 24.72 dB

ANGLE D'OUVERTURE A -3dB : 2 x 5.27 deg.



# 1296 MHz 55 element instruction manual



## ASSEMBLY INSTRUCTIONS

1296 / 55 element F9T ANTENNA

## IMPORTANT

When opening the package, check and compare all parts and hardware with enclosed part list. Then thoroughly and carefully read the instructions.

## ELEMENT ASSEMBLY

For best efficiency, it is necessary to keep the elements at some distance from the antenna boom.

Place element in stand-off (#24 on pictorial diagram, and close-up 3) and gently knock the free tip of the element with a small hammer, to thrust element through hole (close-up 2A and 2B).

Slide element until proper centering is reached (close-up 2C).

Those operations must be carried out with utmost care, to avoid unwanted bending of elements.

## ANTENNA BOOM ASSEMBLY

The red end (cap set #7) indicates the front of the antenna, the black end (cap set #8), the rear. Directors are counted up from rear to front.

Refer to assembly diagram for proper mounting:

Join the three boom sections together; the sections are of the "plug-in" type. Tighten the sections together with the sets of clamps #9 and #10, and M5 wing screw #11. Mount short support leg, as shown on diagram; tighten to boom with sets of clamps #15, #16 and wing screw #17. Mount long support leg, consisting of part #5 (front) and part #6 (rear), as shown in diagram and medalion A; M6 nuts #13 must not be forgotten! Slightly tighten (by hand) nut #13 on M6 screw #12; then slide support leg on screw #12, and screw-in M6 nuts #14. Now, first normally tighten nut #13, and then nut #14. Join both sections of the long leg, with set of clamps #19, plate #20, "alligator" clamp #21, M6 U-bolt #18 and M6 nuts #22. Keep this last assembly temporarily loose.

## ELEMENT POSITIONING ON BOOM

To avoid any confusion, each element is marked with a color (refer to color code in the element table).

Refer to close-up 3 for positioning:

Set the stand-off at slant angle across the boom (phase #1), as close as possible to the locking hole, and then, rotate and slide the stand-off (phase #2) around the boom, so that the bump provided under the stand-off correctly fits into the hole (phase #3). Make sure that the sides of the stand-off also have a tight fit against the walls of the boom (phase #4).

## CAUTION

The reflector is the longest element; each successive director is either the same, or shorter than the prior element. Make sure directors are correctly mounted, by checking the color order, according to code.

If elements are not properly mounted, performance of the antenna may be drastically reduced.

## DRIVEN ELEMENT ASSEMBLY AND FEED-LINE

A short length of 50 Ohm coaxial cable (RG213/U) is factory mounted on the driven element. Run the coax through the 11 mm (7/16 ") hole and attach the driven element with the screws #23.

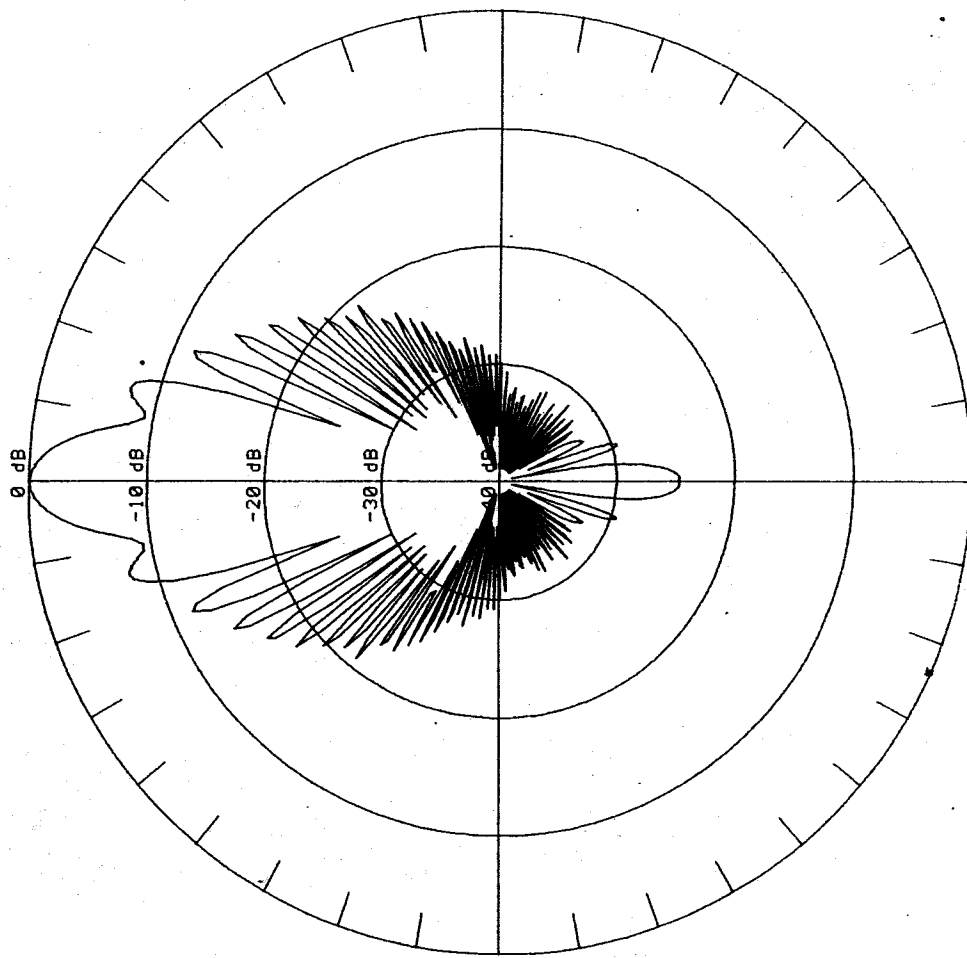
The type N male connector (UG21B/U) must be mounted ONLY ONCE the coax has been run through the big hole (See connector mounting sketch).

DIAGRAMME DE POSITIONNEMENT CALCULE: ANTENNE 55 ELEMENTS LONG YAGI

FREQUENCE: 1296.0 MHz PLAN: H

GAIN CALCULE : 21.25 dB Iso RAPPORT AU./ARR.: 24.72 dB

ANGLE D'OUVERTURE A -3dB : 2 x 5.41 deg.



15	Boom to short leg tightening clamp (see #9)	2
16	Boom to short leg attaching clamp (see #10)	6
17	Boom to short leg tightening screw (M5x45)	2
18	Mast attaching U-bolt (M5x100)	2
19	Mast attaching clamp (smooth holes)	4
20	Mast attaching "alligator" plate	2
21	Mast attaching "alligator" clamp	2
22	Mast tightening M6 nut	4
23	Driven element tightening special screw	2
24	Element supporting stand-off	54 + 1 spare

## ACCESSORIES

Type N male connector UG21B/U

## ELEMENT LENGTH

Element *	Millimeters	Inches	Color code
Reflector	: 115	4" 17/32	Black
Driven element	: 102	4" 1/64	(none)
Director 1	: 99	3" 57/64	Brown
Director 2	: 96	3" 25/32	Red
Director 3	: 94	3" 47/64	Orange
Director 4	: 93	3" 45/64	Yellow
Director 5	: 92	3" 21/32	Green
Director 6	: 91	3" 5/8	Blue
Director 7	: 90	3" 37/64	Violet
Director 8 thru 14	: 7 x 90	7 x 3" 35/64	White
Director 15 thru 21	: 7 x 89	7 x 3" 1/2	** Black
Director 22 thru 27	: 6 x 88	6 x 3" 15/32	** Red
Director 28 thru 34	: 7 x 87	7 x 3" 27/64	** Orange
Director 35 thru 41	: 7 x 86	7 x 3" 25/64	** Yellow
Director 42 thru 53	: 12 x 85	12 x 3" 11/32	** Green

\* One more reflector is joined, as spare.

\*\* Indicates that one end of the element is white, to avoid confusion with other elements coded with the same color at both ends.

## 1269 MHz OPERATION

As delivered, the antenna is tuned for operation at 1296 MHz with a 2 MHz bandwidth, for an acceptable SWR of 1.2/1 or better.

If operation on 1269 MHz, is desired, perform the following modifications:

Spacings (millimeters and inches):

R - DE	: 38	1" 1/2	D2 - D3	: 57	2" 1/4
DE - D1	: 39	1" 17/32	D3 - D4	: 60	2" 3/8
D1 - D2	: 21	0" 13/16	D4 - D5	: 79	3" 1/8

Other spacings, as well as element lengths remain unchanged.

With those modifications, the SWR goes down to an acceptable level in the uplink sub-band of OSCAR 13, when switched in mode L operation.

The power splitters referenced earlier can also be used on 1269 MHz, without any modification.

NOTE: The company ANTENNES TONNA S.A. reserves for itself the right for modifying its products, without any notice.

This coax length is not randomly cut: for stacking purposes, this length is an integer number of electrical half-wavelengths, and is the same on all manufactured antennas (see "Stacking information" clause).

As a feed line, a very high quality, low loss coax cable is strongly recommended. Remember that the RG213/U exhibits a loss of 29 dB for 100 m (6.8 dB for 100 feet) at 1.3 GHz. If better coax is available, use it. The feed line must be fitted with a standard type N female connector, such as the UG23B/U, or a special one designed for thicker coax, with UG23B/U nozzle.

## MOUNTING OF ANTENNA TO MAST

The purpose of the short supporting leg is to avoid the mast to run through the element plane. As the usual diameter of the mast lies in the range from 40 to 54 millimeters (1" 1/2 to 2" 1/8), this dimension is close to the quarter wave at 1.3 GHz, and thus, the efficiency of the antenna may greatly decrease if the mast runs across the element plane.

Therefore, if an antenna is to be used single, it must be mounted on top of mast, or aside the mast with the help of a right angle banded piece of tubing (horizontal part: about 50 cm, or 20" long), this to minimize the influence of the main mast.

The maximum useful mast diameter is 54 millimeters (2" 1/8).

Run mast through clamp sets, and tighten short leg to mast. Then apply upward pressure on the long supporting leg; hold in this position while tightening (nuts #22). This is to slightly stress the boom, to hold it in a horizontal position, without downward droop.

## STACKING INFORMATION

If two, four or more antennas are to be stacked in phase, make sure that coax cable strip-off process is achieved the same way on all the antennas (same length of insulator removed on all lines). During mounting process on the stacking frame, make sure antennas are properly phased in. The bump on the plastic shell of the driven element marks the outer conductor of the feed line. ALL THE BUMPS MUST FACE THE SAME SIDE (all left or all right, in horizontal polarization; all up or all down, in vertical polarization).

For proper impedance matching, it is recommended to use the special power splitters designed for that purpose:

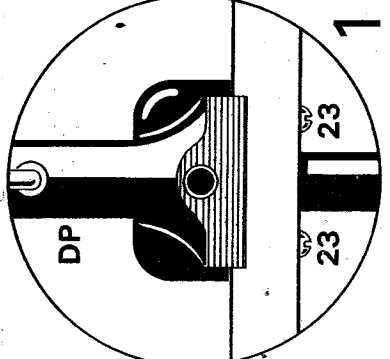
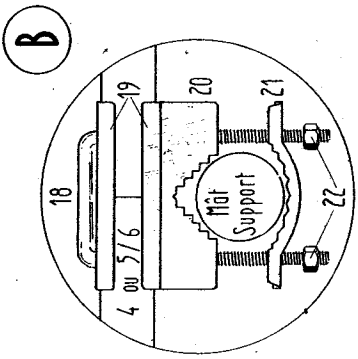
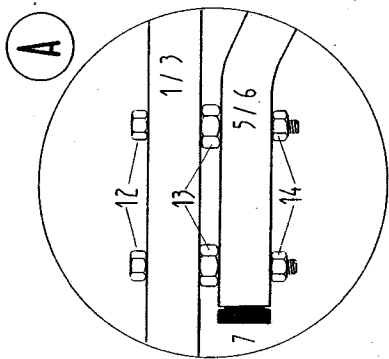
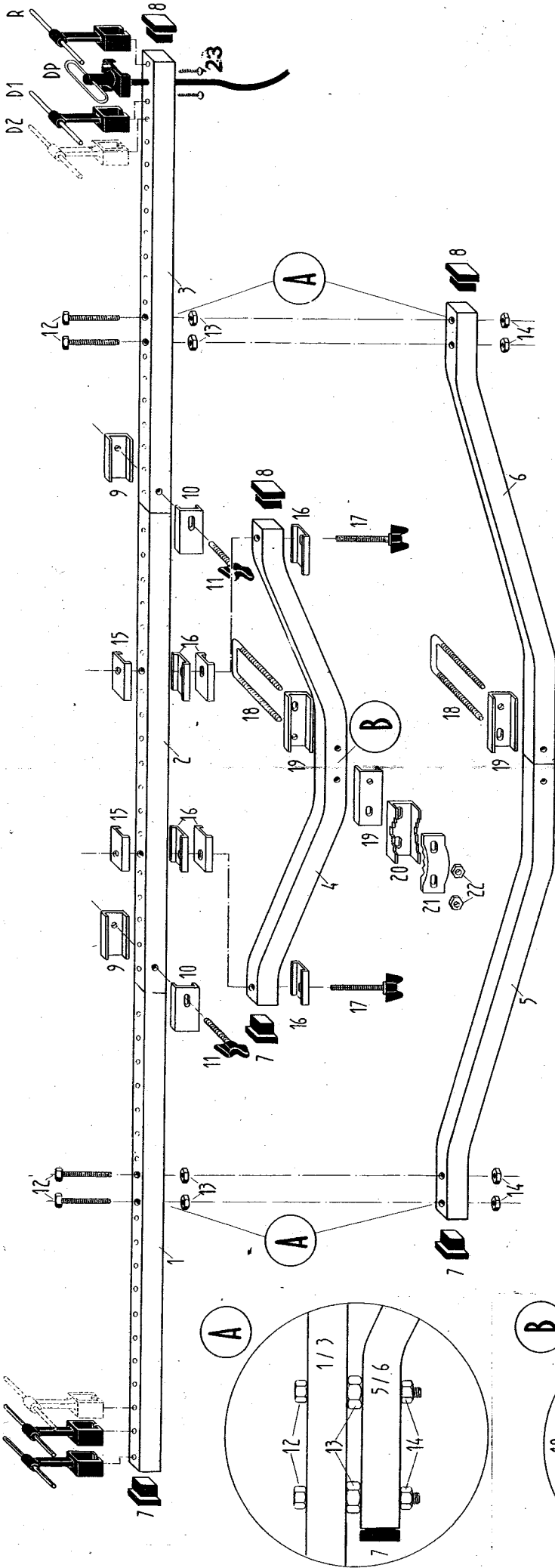
two-port splitter, part # 29223  
four-port splitter, part # 29423

Proper combination of two- and four-port splitters allows stacking of 8, 16 or even more antennas, provided phase lines are correctly tailored.

## PART AND HARDWARE LIST

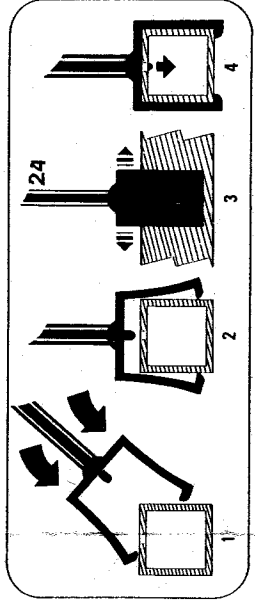
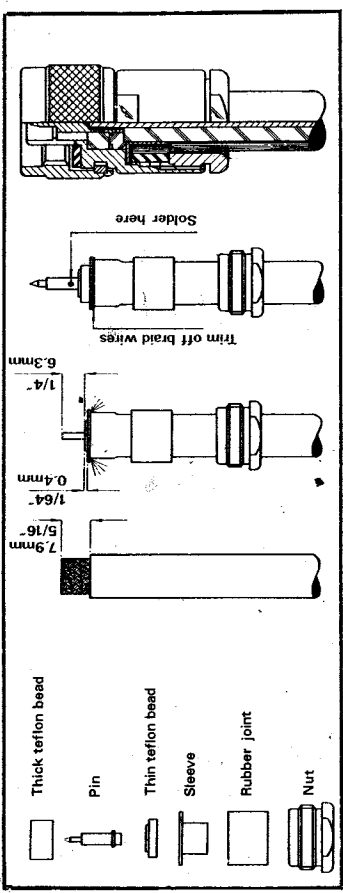
Diagram #	Description	Quantity
1	Front boom section	1
2	Central boom section	1
3	Rear boom section	1
4	Short supporting leg	1
5	Long leg front part	1
6	Long leg rear part	1
7	Red plastic cap (front indicator)	3
8	Black plastic cap (rear indicator)	3
9	Boom attaching clamp (M5 threaded hole)	2
10	Boom attaching clamp (smooth hole)	2
11	Boom attaching screw (M5x25)	2
12	Boom to long leg attaching screw (M5x50)	4
13	Boom to long leg spacing M6 nut	4
14	Boom to long leg tightening M6 nut	4

D53 D52 D51



**SCHEMA  
DE MONTAGE  
SIMPLIFIE**

**non  
à l'échelle**



**SIMPLIFIED  
MOUNTING  
DIAGRAM  
not to scale**

Antenne 20655

0655/A