

# History of Tellurometer 1956 to 2008

by  
Alan Wright and Brian Sturman

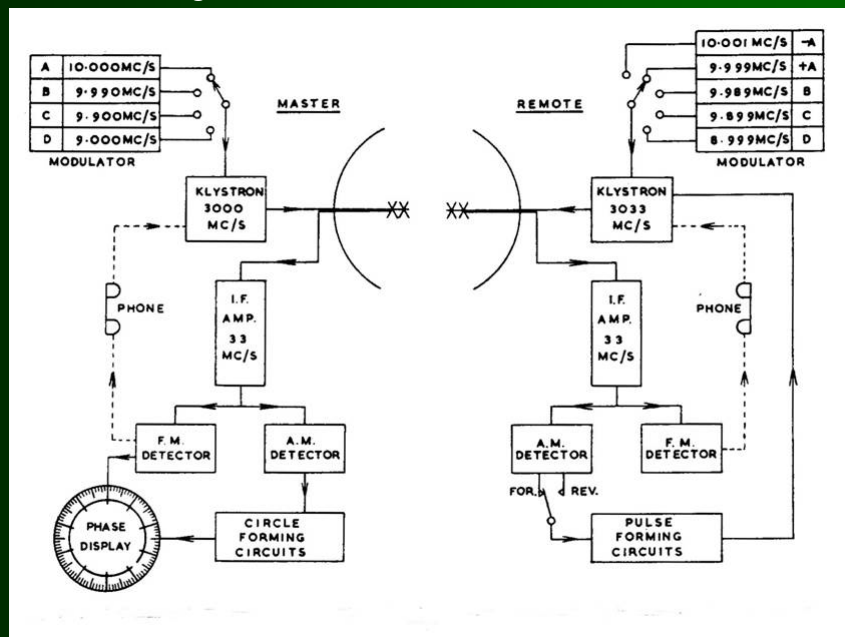


Wadley with prototype



1956 : 35 miles, 2"

MRA 1 Block diagram



MRA 1



1957 : 35 miles, 2"

Wadley lecturing at Ridgeway Base



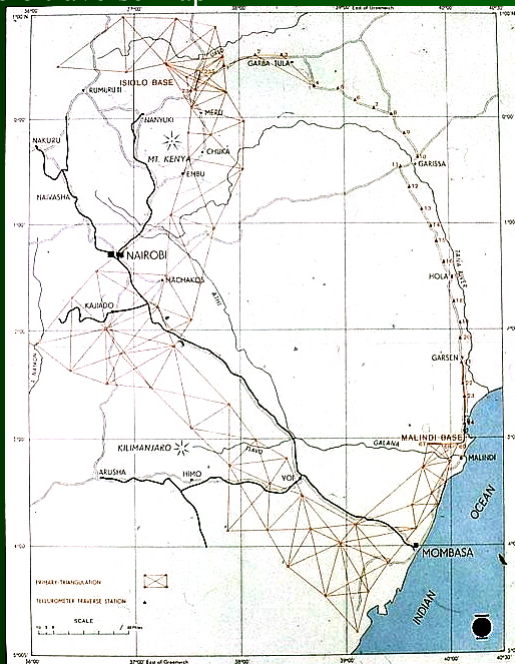
MRA 1 on Jungfrau Glacier



MRA 1 Arthur Allan on Malindi – Isiolo traverse



## Malindi – Isiolo traverse map



## Mr. Fix-it servicing MRA 1

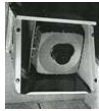


**Mr. Fix-it**

We understand that a Canadian mapping firm operating in the far east was plagued with Tellurometer failures until it engaged the services of the trouble shooter shown in the picture. Since then distance measurements have proceeded smoothly.



Tellurometer Chronology						
original requirement estimated at 250 instruments						
within 10 years more than 6000 had been sold. High volume products in <i>italics</i>						
Year	Land Survey	Dynamic /	Engineering / Infrared	Maximum	Instrumental	Resolution
1956	Tellurometer Prototype			35 miles	± 2 inches	3
1957	<i>MRA1</i>			35 miles	± 2 inches	3
1958						
1959	<i>MRA2</i>			35 miles	± 2 inches	3
1960		<i>MRB2</i>		40 km	± 1.5 m	10
1961		MRC2/MRC12		50 km	± 1 m	3
1962	<i>MRA3</i>			50 km	± 15 mm	2
1963						
1964	<i>MRA101</i>		MODLITE (MA100)	2 km	± 1.5 mm	2
1965				50 km	± 15 mm	3
1966	MRA301			50 km	± 15 mm	4
1967	MR44			50 km	± 3 mm	3
1968			<i>MA100</i>	2 km	± 1.5 mm	2
1969		<i>MRB201</i>		100 km	± 1.5 m	3
1970		MRB301		100 km	± 1 m	3
1970	<i>MRA5</i>			50 km	± 10 mm	3
1971	<i>CA1000</i>					
1972						
1973			<i>CD6</i>	800 m	± 5 mm	5
1974						
1975		CA1000D		25 km	± 0.6 m	5
1976						
1977			<i>MRD1</i>	100 km	± 1 m	3
1978				25 km	± 6 mm	3
1979	<i>CMW20</i>			50 km	± 10 mm	3
1980	<i>MRA6</i>					
1981						
1982						
1983						
1984						
1985	<i>MRA7</i>			50 km	± 15 mm	2
1986			MA200	1.5 km	± 0.5 mm	0.5
1987						
1988						
1989						
1990			Hydroflex	100 km	± 1.5 m	3
1991						
1992						
1993						
1994						
1995			MRD4	50 km	± 0.1 m**	3
1996					**Instrumental accuracy, Positional accuracy is dependant on site geometry	
1997						
1998						
1999						
2000	MRA7 (mine hoist variant)					
2001						
2002						
2003						
2004						
2005						
2006						
2007						
2008	MRA7 still in production					



MRA 2 in Canada



1959 : 35 miles, 2"

Wadley with MRA 3



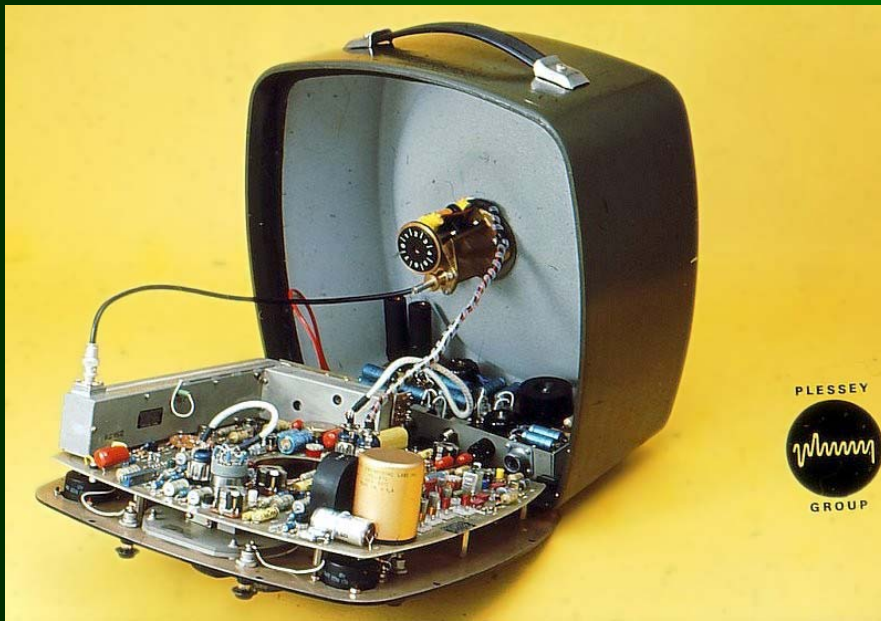
1962 : 50 km, 15 mm

MRA 101 in Greenland



1964 : 50 km, 15 mm

Inside MRA 101



MRA 301



1966 : 50 km, 15 mm



MRA 4



1967 : 50 km, 3 mm

CA 1000



1971 : 10 km, 15 mm

MRA 5



1970 : 50 km, 50 mm

MRA 5



MRA 6 / CMW 6



1980 : 50 km, 10 mm

CMW 20



1979 : 25 km, 5 mm

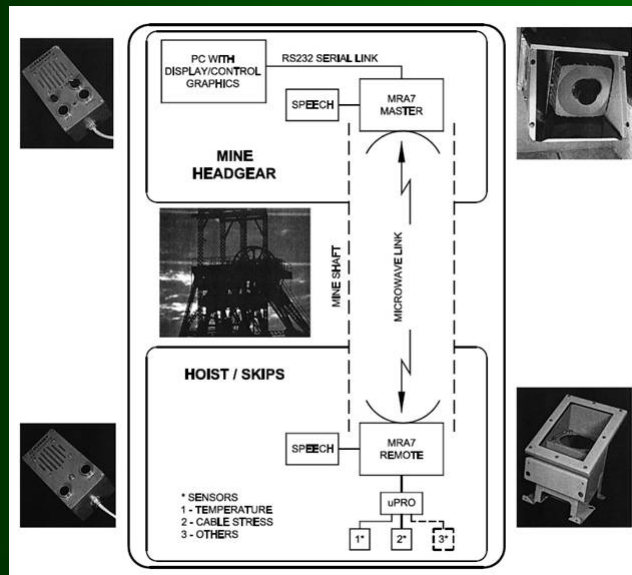
MRA 7

# TELLUROMETER MRA 7

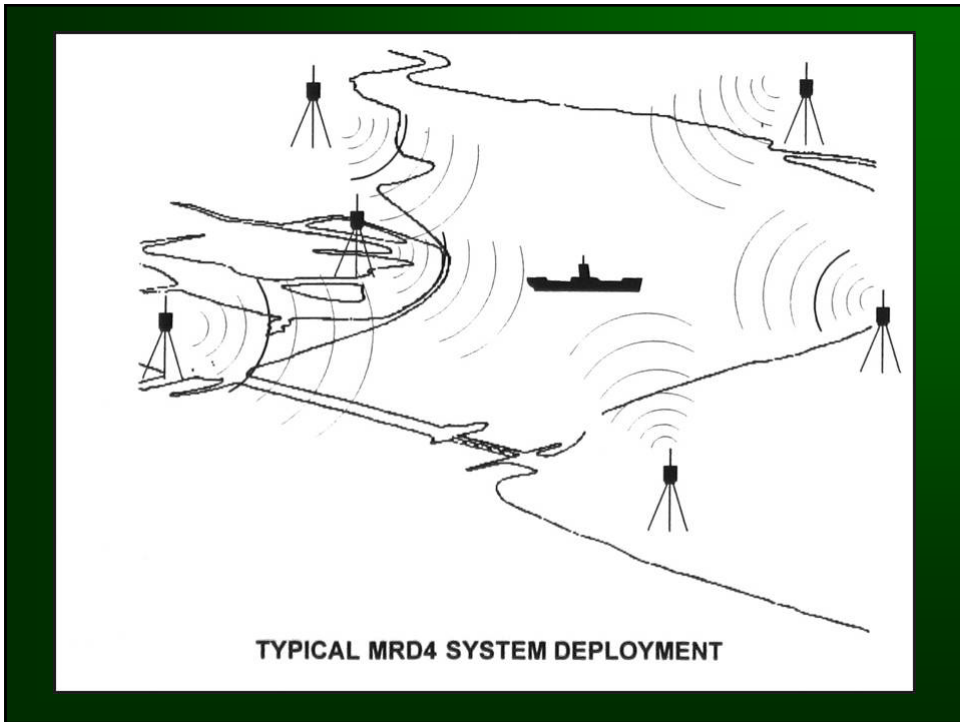
Microwave distance  
measurement



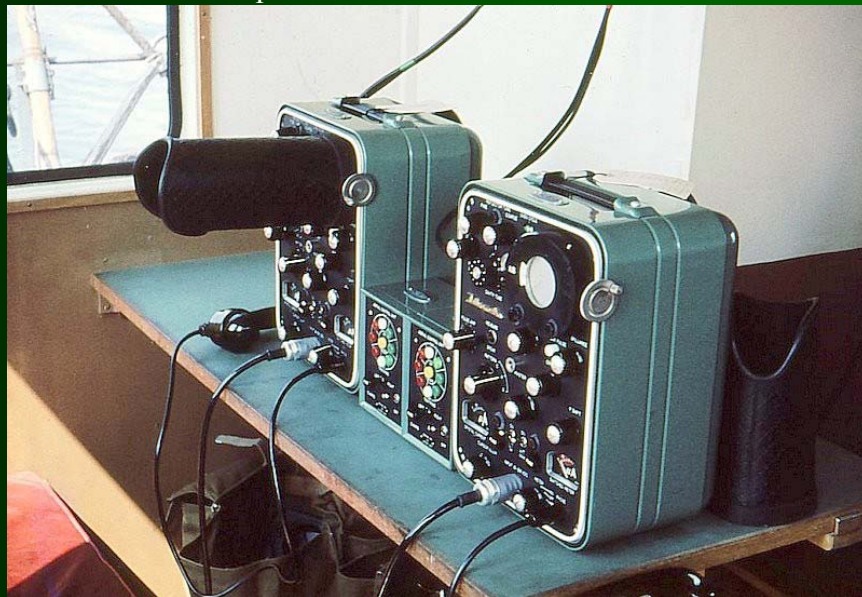
1985 : 50 km, 15 mm





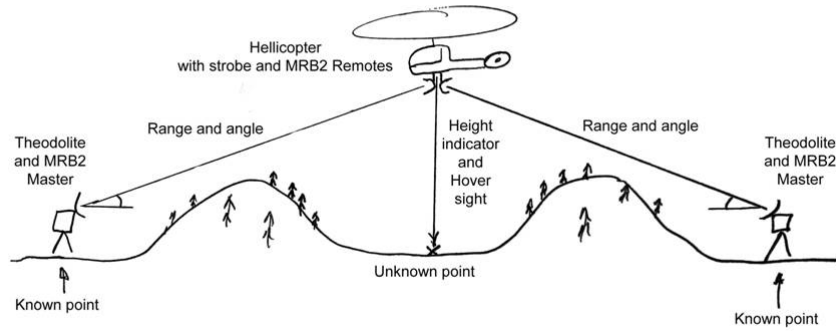


MRB 2 on board ship



1960 : 40 km, 1.5 m

ABC System  
Used by US Geological Survey



Mike Mogg and Aerodist



1961 : 80 km, 1 m

MRB 201



1969 : 100 km, 1.5 m





MRB 201 on Single Buoy Mooring



1969 : 100 km, 1.5 m

Tony Hamblin with MRB 201 on oil tanker





## MRD 1 and Hydroflex



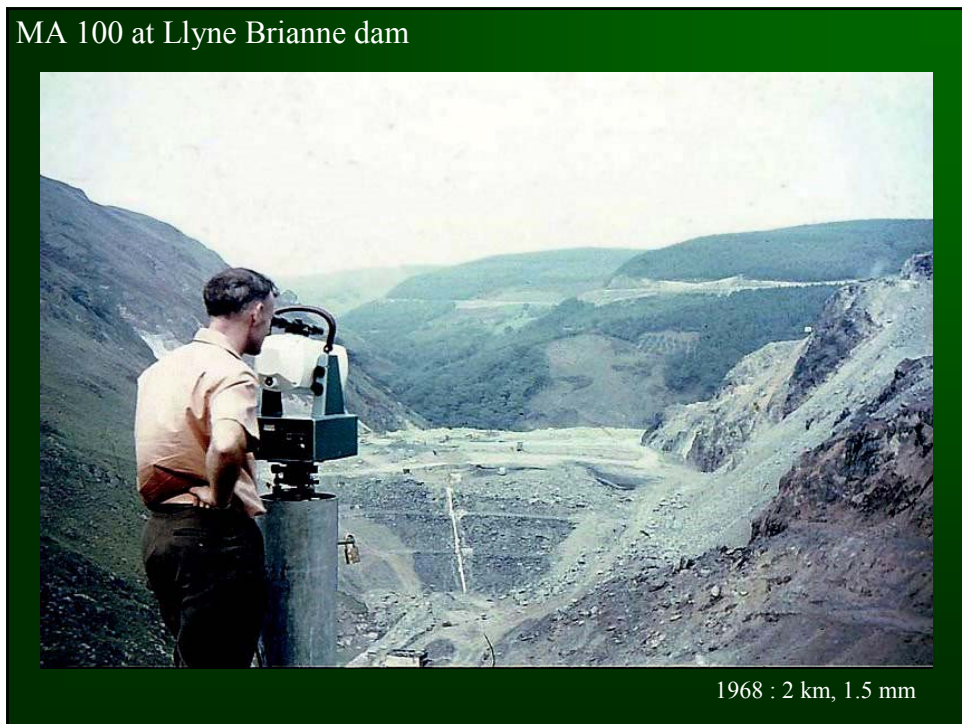
1978 : 100 km, 1 m

## MRD 4



1995 : 50 km, 0.1 m

Tellurometer Chronology						
original requirement estimated at 250 instruments						
within 10 years more than 5000 had been sold. High volume products in italics						
Year	Land Survey	Dynamic /	Engineering / Infrared	Maximum	Instrumental	Resolution
1956	Tellurometer Prototype			35 miles	± 2 inches	3
1957	<i>MRA1</i>			35 miles	± 2 inches	3
1958						
1959	<i>MRA2</i>			35 miles	± 2 inches	3
1960		<i>MRB2</i>		40 km	± 1.5 m	10
1961		MRC2/MRC12		50 km	± 1 m	10
1962	<i>MRA3</i>			50 km	± 15 mm	3
1963						
1964			MODLITE (MA100)	2 km	± 1.5 mm	2
1964	<i>MRA101</i>			50 km	± 15 mm	3
1965						
1966	<i>MRA301</i>			50 km	± 15 mm	4
1967	<i>MRA4</i>			50 km	± 3 mm	3
1968			<i>MA100</i>	2 km	± 1.5 mm	2
1969		<i>MRB201</i>		100 km	± 1.5 m	3
1970		<i>MRB301</i>		100 km	± 1 m	3
1970	<i>MRA5</i>			50 km	± 10 mm	3
1971	<i>CA1000</i>					
1972						
1973			<i>CD6</i>	800 m	± 5 mm	5
1974						
1975		<i>CA1000D</i>		25 km	± 0.6 m	5
1976						
1977						
1978		<i>MRD1</i>		100 km	± 1 m	3
1979	<i>CMW20</i>			25 km	± 6 mm	3
1980	<i>MRA6</i>			50 km	± 10 mm	3
1981						
1982						
1983						
1984						
1985	<i>MRA7</i>			50 km	± 15 mm	2
1986			<i>MA200</i>	1.5 km	± 0.5 mm	0.5
1987						
1988						
1989						
1990		Hydroflex		100 km	± 1.5 m	3
1991						
1992						
1993						
1994						
1995		<i>MRD4</i>		50 km	± 0.1 m**	3
1996					**Instrumental accuracy, Positional accuracy is dependant on site geometry	
1997						
1998						
1999						
2000	<i>MRA7</i> (mine hoist variant)					
2001						
2002						
2003						
2004						
2005						
2006						
2007						
2008	<i>MRA7</i> still in production					





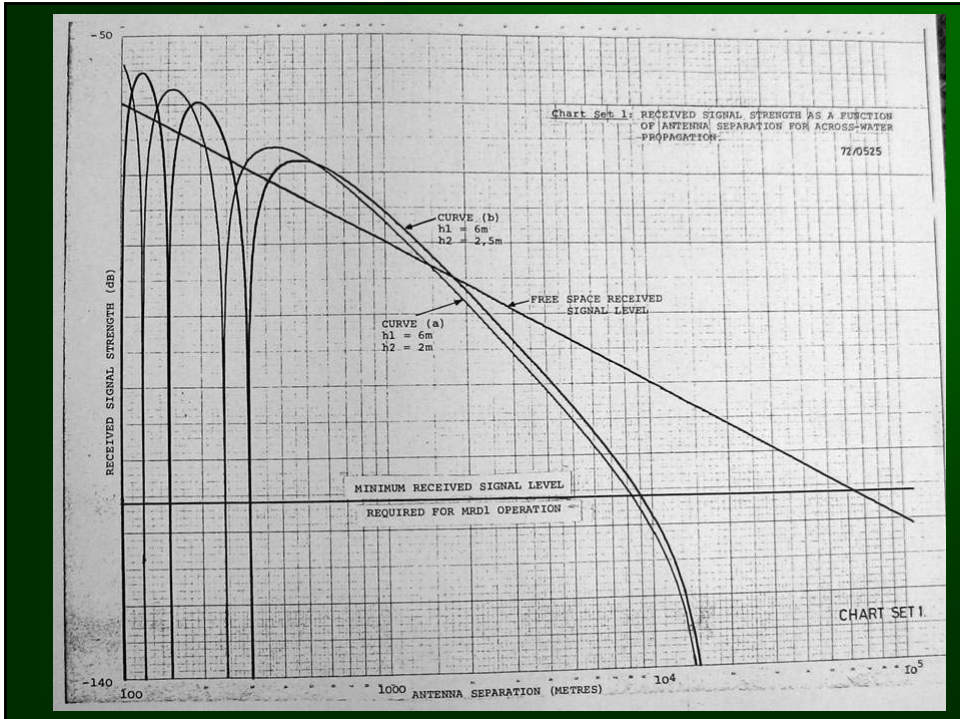
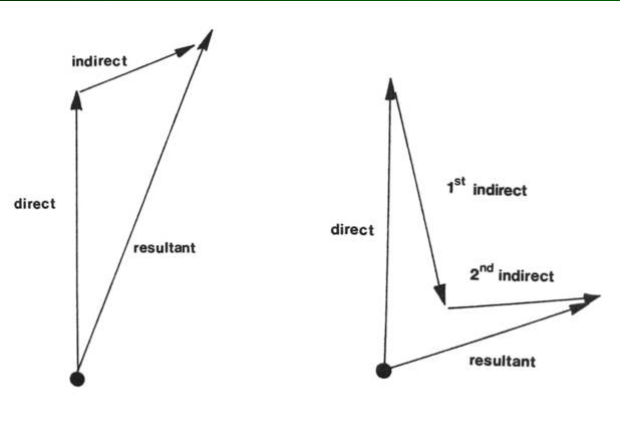
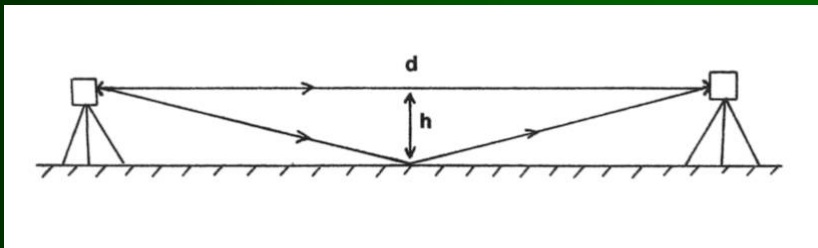
MA 200

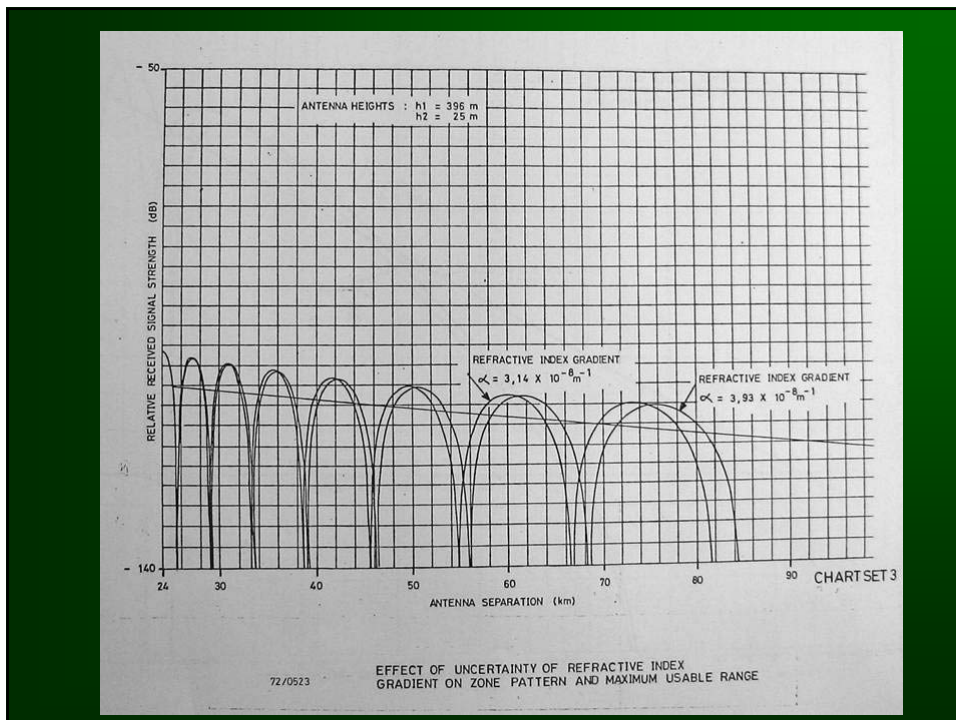
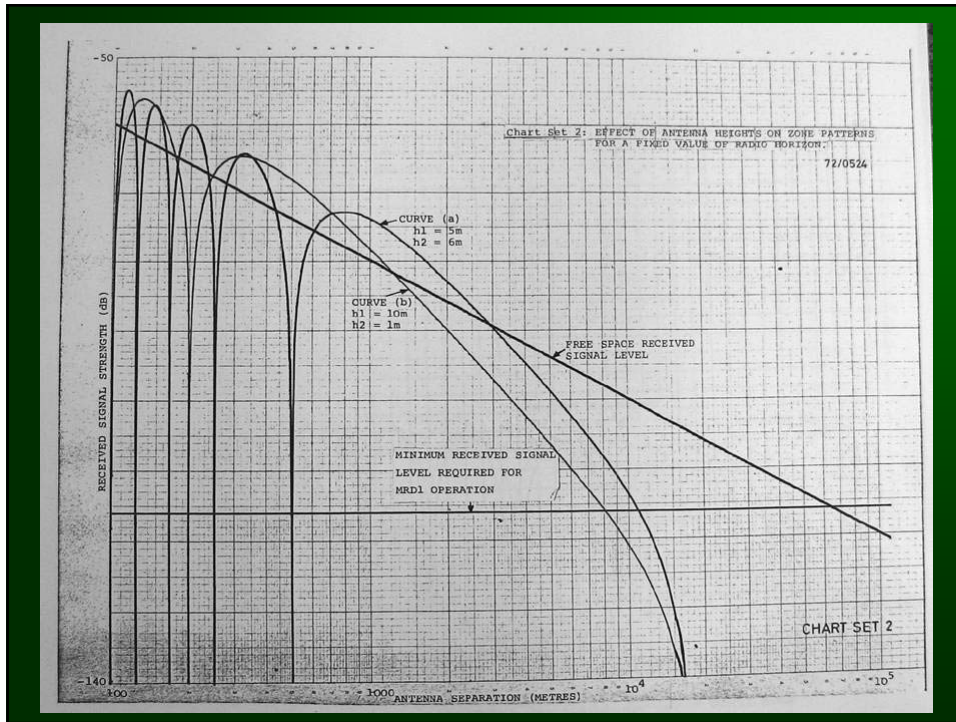


1986 : 1.5 km, 0.5 mm

Thank you for your attention







# REFRACTIVE INDEX OF RADIO WAVES

(EXTENDED RANGE) °CENTIGRADE/MILLIBAR

**EXAMPLE**

$t = 15^\circ\text{C}$   
 $t' = 10^\circ\text{C}$   
 $P = 800$   
 $N = 274$

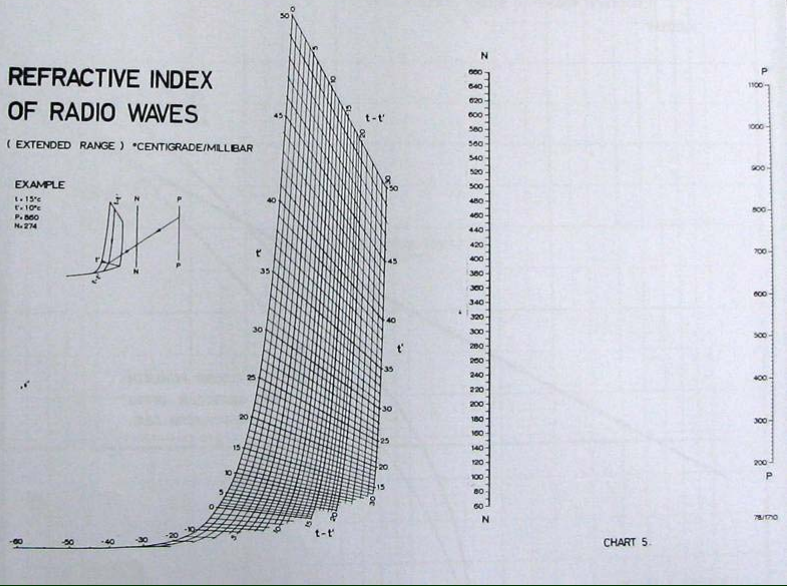
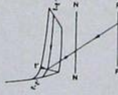


CHART 5