



**Antecedentes y Proyectos  
realizados por CITEFA  
para la Artillería  
del Ejército Argentino**

*Exposición por el My (R) Ing. Roberto Corti, en 2004*



# Proyectos Realizados y Terminados (desde 1950)

**28** Proyectos para la Artillería  
(5 cañones, 3 coheteras y 21 municiones)

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**21** Proyectos para la Infantería y Caballería  
(5 cañones y 16 municiones)

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**40** programas de software especial (Balística, Tablas de Tiro, diseño de Tubos, Afustes, Projectiles, etc.)



# Los primeros Cañones ...

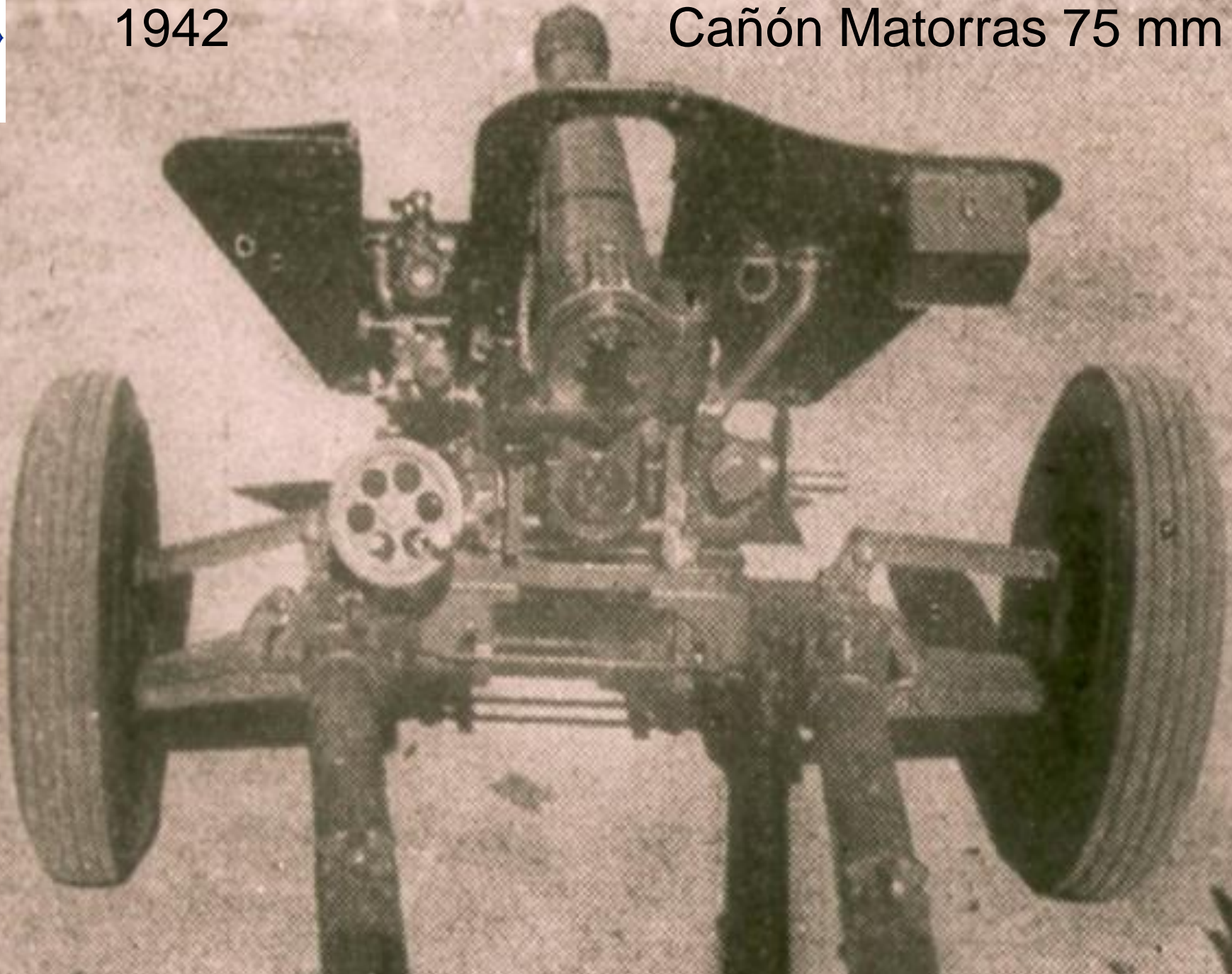
en CITEFA





1942

Cañón Matorras 75 mm





# 1951 Cañón Sin Retroceso Czekałski 75 mm







# Cañón Sin Retroceso cal. 105 mm Czekalski

1968



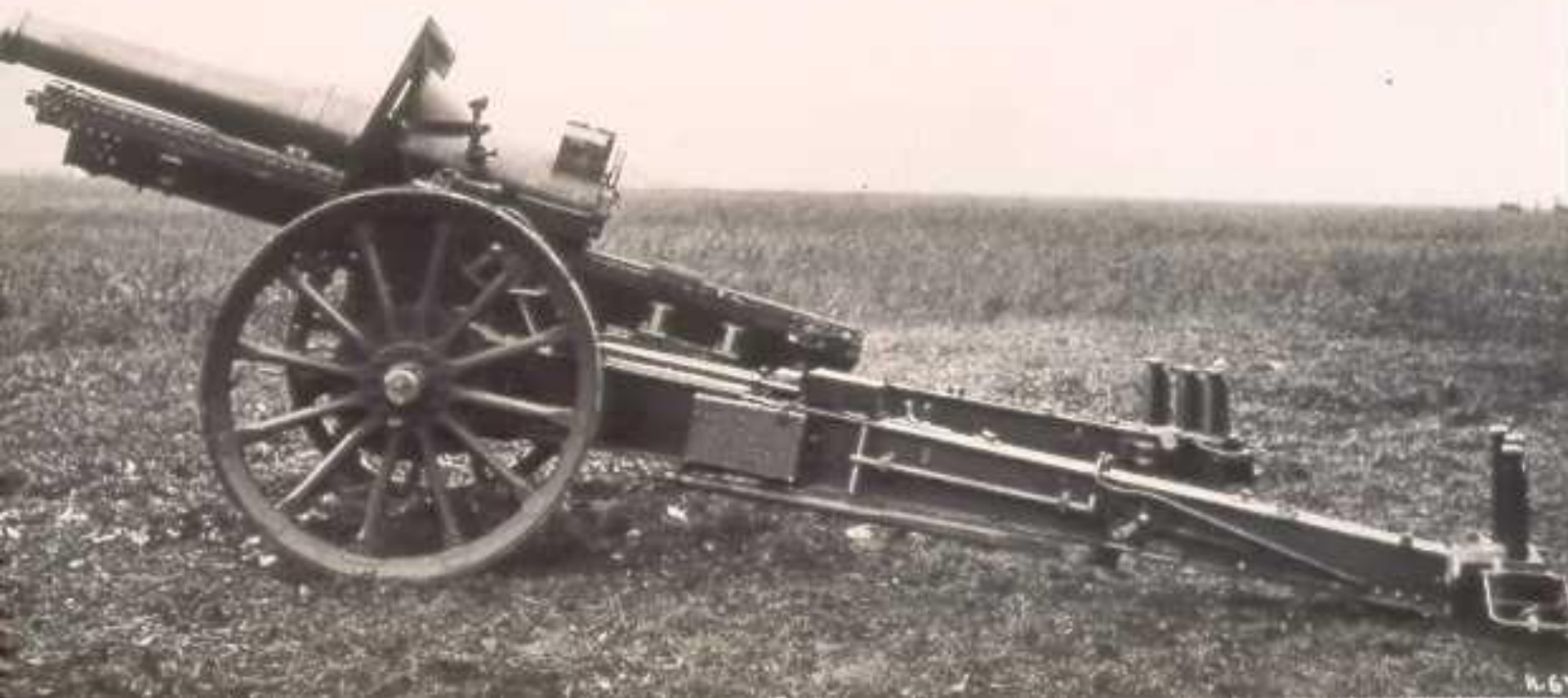


# **Transformación y Modernización de piezas de Artillería**





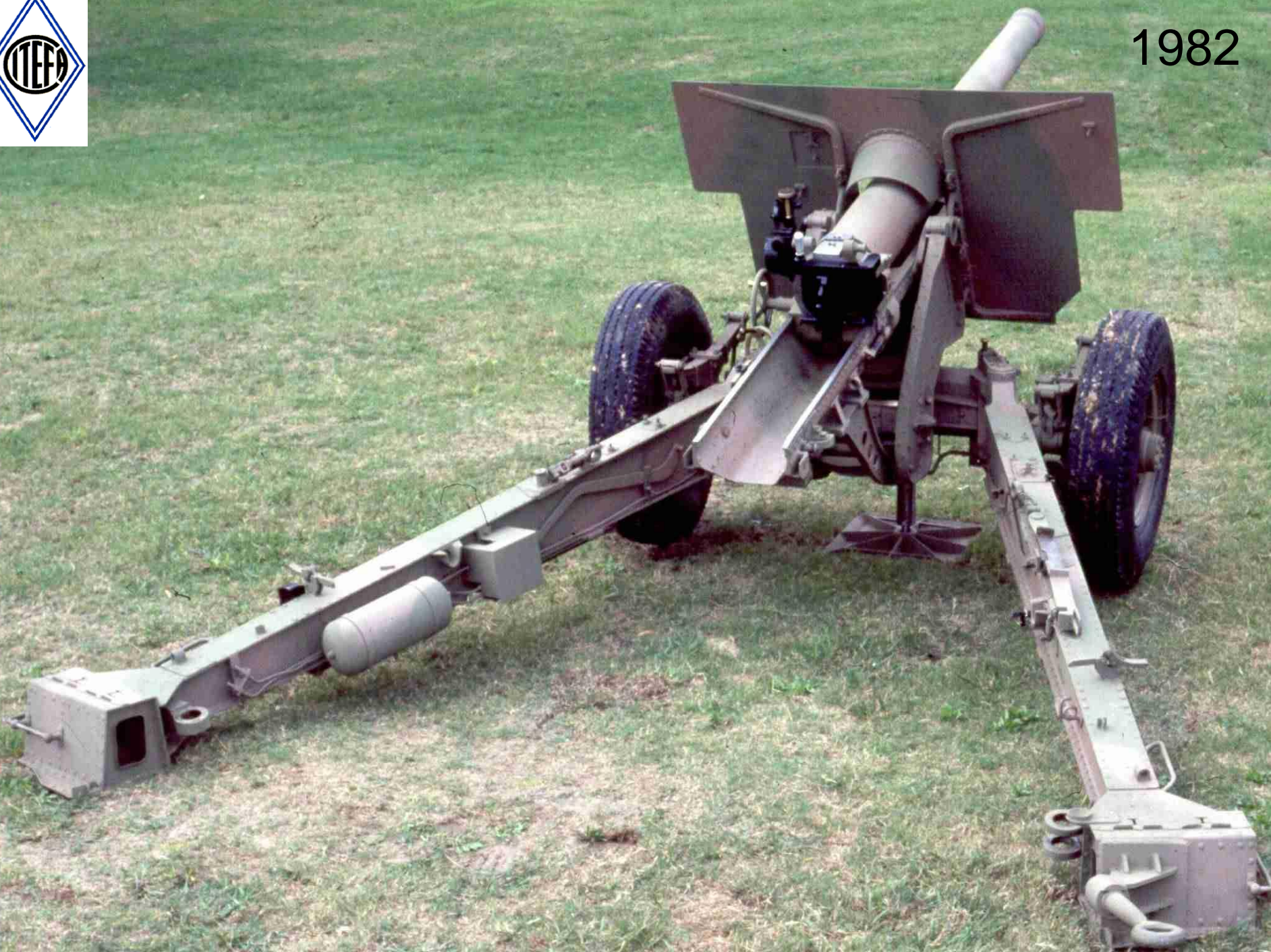
# El Cañón SCHNEIDER 105 mm L.30,8 Mod.1928







1982







1982







# Desarrollo de nuevas piezas de Artillería



**Cañones  
SOFMA y CITER  
155 mm L.33**





## Cañón Argentino SOFMA 155 mm L.33 Mod.1977







# Cañón CITER 155 mm L.33 Mod. 1981







Islas Malvinas - 1982





MEMORIA / POSTALES DE GUERRA

# Los cañones de Malvinas

Las piezas de artillería cordobesas que fueron trasladadas a las islas se convirtieron en un arma clave para las tropas argentinas y se ganaron el respeto de los ingleses; hoy una de ellas ocupa un lugar en el Museo de los Paracaidistas de Aldershot, cerca de Londres

Por Alejandro J. Amendolara

548 TOWED GUNS AND HOWITZERS / Argentina

## ARGENTINA

### 155 mm Howitzer L33 X1415 CITEFA Models 77 and 81

These weapons are basically the top carriage (barrel, cradle, recoil system and equilibrators) of the French 155 mm self-propelled gun Mk F3 (which has been used by the Argentine Army for some years) mounted on a new bottom carriage designed by the Scientific and Technical Research Institute of the Armed Forces (CITEFA).

The 155 mm Howitzer L33 X1415 CITEFA Model 77 has been designed for use in all types of terrain and climate, especially Patagonia.

The top carriage is a welded steel structure which contains the elevating brackets and traverse mechanism, and forms the connection with the cradle trunnion attachment and the bottom carriage. The traversing mechanism is mounted inside the front and bottom of the top carriage and to obtain acceptable handwheel loads, two pneumatic equilibrators are connected to the top carriage and cradle.

The bottom carriage is a steel welded and machined unit. For firing the wheels are raised clear of the ground and the weapon rests on a firing base at the front and on the trails at the rear. The firing base is a circular steel structure mounted on a ball socket, suspended underneath the bottom carriage, which compensates for uneven ground contour. The firing base is normally carried on the bottom carriage when travelling as the ground

clearance of 0.3 metre makes removal unnecessary during movement suspension is of the spring type.

The L33 X1415 fires an HE projectile weighing 43 kg with a muzzle velocity of 765 metres a second and illuminating ammunition.

The Model 81 is a slightly revised version of the Model 77, it is a locally-produced copy of the 155 mm Mk F3 barrel. Some changes have been made to the trail legs and to the recuperator and equilibrators. Model 81 has exactly the same specifications as the Model 77 for the same ammunition.

Status: In production, in service with Argentina.

Manufacturer: Instituto de Investigaciones Científicas Y Técnicas Fuerzas Armadas (CITEFA), Zufriategui y Varela, 1603 Villa Constitución de Buenos Aires, Argentina.

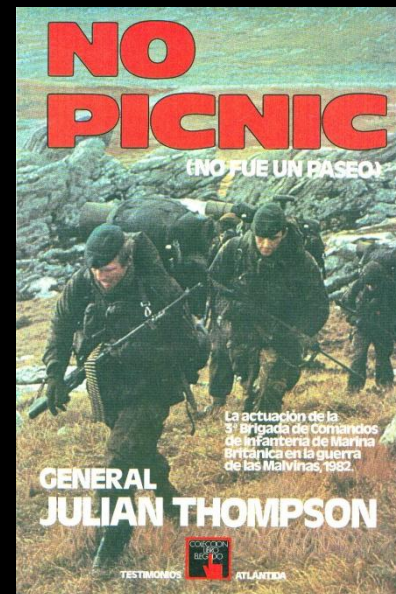


155 mm howitzer L33 X1415 CITEFA Model 77 in firing position with barrel at maximum elevation



Front view of L33 Model 81 at full elevation

SPECIFICATIONS					
CALIBRE	155 mm	LENGTH	10.15 m		
BARREL LENGTH	5.115 m	WIDTH	2.67 m		
MUZZLE BRAKE	double-baffle	HEIGHT	2.2 m	RATE OF FIRE	
MOUNTING	split trail	(GROUND CLEARANCE)	0.3 m	(Maximum)	4 rpm
WEIGHT (travelling order)	8000 kg	TRACK	2.31 m	(Sustained)	1 rpm
		ELEVATION/DEPRESSION	+67°-0°	MAX RANGE	
		TRAVERSE (total)	70°	(normal round)	22 000 m
				(RAP)	25 300 m



La actuación de la 3ª Brigada de Comandos de Infantería de Marina en las Malvinas, 1982.

## GENERAL JULIAN THOMPSON



Los tres howitzer de 155 mm en torno de Puerto Argentino, que pueden disparar sus bombas de 95 libras a unos 22 kilómetros de distancia, crearon problemas a la Tercera Brigada.





**Londres**



**Aldershot**











# ARGENTINE 155 mm HOWITZER L33 X1415 CITEFA

This gun consists of the top carriage of the French 155 mm SP Gun Mk 3 and is mounted on a new carriage designed by CITEFA. It fires HE, smoke and illuminating rounds.

## Data:

Weight 8000 Kg	Weight of Shell 96lbs
MV 765 m/sec	Range 18 000 m

This gun was used by the Argentinians during the Falklands Campaign (April - June 1982).

It was located above Port Stanley at the IONOSPHERIC STATION and was used against 3 PARA during their assault on Mt. Longdon on 11/12 June and against 2 Para on 13/14 June when they attacked Wireless Ridge.

Both Battalions suffered casualties from this shelling.



A large, olive-green self-propelled howitzer, the CALA 30, is the central focus of the image. It is mounted on a heavy-duty chassis with large, treaded tires. The long barrel of the howitzer extends towards the left. In the background, other military vehicles and personnel are visible, suggesting a public display or parade. The scene is set on a city street with buildings and trees.

**CALA 30**  
**155 mm L.45**



Cañón CALA 30/1 155 mm L.45

1986







Cañón CALA 30/2 155 mm L.45

1994



9 20 94





# Cañón CALA 30/2 155 mm L.45

1994







Cañón CALA 30/2 155 mm L.45

1994





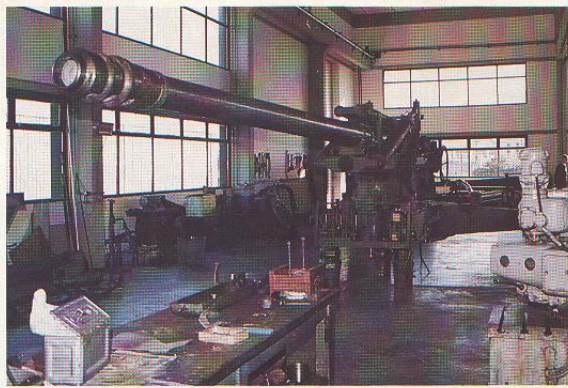


# Tiro de homologación Alcance Máximo 39,5 km Serrezuela (Córdoba)





# Military Technology



Two interesting images — amongst the first to appear in the open press — of the prototype of the new Argentinian CALA 30 (Cañon de Artillería de Largo Alcance) 155 mm, 45-caliber towed gun/howitzer, jointly developed by CITEFA (Instituto de Investigaciones Científicas y Técnicas de las Fuerzas Armadas Argentinas) and DGFM (Dirección General de Fabricaciones Militares). The ordnance has recently completed a first series of firing trials at the Corдоба firing range.

The CALA 30, which has a monobloc barrel with progressive rifling (48 right-hand grooves) fires three main types of ammunition, namely: PACU (conventional with base bleed), PALA 30 (ERFB) and PALA 37/H (ERFB with base bleed). Maximum range is 37km with PALA 37/H rounds. The gun/howitzer and its range of ammunition are collectively referred to as the SALA 30 system.

Although both the ordnance and the ammunition range are officially claimed to be of totally indigenous design and development, it is difficult not to speculate on some form of involvement by Dr. Bull and his SRC company. (Photo: Jose M. Capellano).

Jane Weekly

## Argentina boosts artillery capability with SALA-30

by José Miguel Rodríguez Fernández

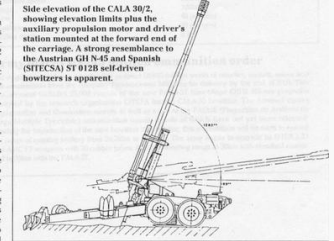
keen to learn from experience in the 1982 Falklands War and in conflicts elsewhere, the Argentinian army has analysed the various equipments used. One of the results has been development of the SALA-30 (Sistema de Artillería de Largo Alcance) artillery system, key elements of which are automated versions of the CALA 30 (Cañon de Largo Alcance) 155mm 45-calibre, long-range howitzer. Bearing a close resemblance to earlier extended-range howitzer designs by the late Gerald Bull, these are currently being constructed by the Argentinian centre for scientific and technical research, CITEFA (Centro de Investigaciones Científicas y Técnicas de las Fuerzas Armadas).

The SALA-30 includes the Santa Barbara artillery fire-control system, which embraces both computers and sensors, plus the CALA-30 howitzer (either in its 30/1 (road) or 30/2 (self-driven version)). The 30/1 model has an on-board power unit to operate hydraulic motors for the trail wheels, the towing eye, the trail-opening system and the rammer. The 30/2 also has a Deutz diesel engine, which enables the howitzer to be moved independently of its tractor.

The production model 155mm barrel, made in auto-forged ESR (Electro-Slag Refined) steel, is expected to be 47 calibre long and will be fitted with a triple-baffle muzzle brake which reduces firing noise to 100dB. Wear life of the tube is expected to be 2,000 rounds when using a new charge developed by CITEFA, which will fire low-drag ERFB (extended range full bore) projectiles to their maximum range. The breech of the 45- and 47-calibre tubes has been designed to withstand the highest temperatures and pressures generated by the new charge. In line with current artillery trends, CITEFA is also developing a new 52-calibre tube which should be ready at the end of 1993.

The four-wheel carriage has a welded-steel structure. The cylindrical cradle incorporates a recoil-guidance key. The walking beam suspension system has two wheels on either side of the carriage and has been simplified for ease of use and maintenance. The reinforced box-section trails are each fitted with a spade and an auxiliary external wheel which is raised for long journeys. Since the carriage wheels are free-moving, the howitzer can be towed by a truck at up to 90km/h on the road and 20km/h cross-country.

All parts are checked by X-ray and ultrasound and manufactured to tolerances of about 0.001mm. The breech obturator is a simple and efficient design, demanding little attention from the three-man crew who can also readily manipulate the handwheels used to lay the gun in azimuth or elevation. The auxiliary power system weighs 21kg all up. It includes a 4.1-litre Deutz four-cylinder diesel engine, supercharged and air-cooled, with a power output of 120hp at 2,800 rpm; a closed-cycle hydraulic pump linked to the engine through a flexible coupling (operating pressure 210 bars, with a maximum speed of 2,900rpm); four variable-flow



A prototype carriage under construction in the CITEFA workshop.

Hydraulic motors (maximum pressure 400 bar, maximum speed 4,500rpm); epicyclic reduction gears for each of the four wheels. The four main wheels are fitted with mechanical brakes. The two trail wheels

INTERNATIONAL DEFENCE REVIEW 8/1993

### ARTILLERY

## Argentina to join the 39 km howitzer club

BY CHRISTOPHER F FOSS  
LONDON

South America's longest range artillery system is expected to begin final qualification trials with the Argentine Army later this year.

The 155 mm/45 calibre Long Range Artillery Cannon (CALA 30/2) is expected to achieve a maximum range of 39 000 m, using new base bleed ammunition also under development.

The Argentine Army has already placed an initial order for an undisclosed number of systems. Production will be undertaken at local Military Manufacturing Establishments.

It has been under development as part of the Long Range Artillery System, which also incorporates a new family of ammunition developed by the Argentine Armed Forces Research and Technology Institute (CITEFA). Ammunition includes PACU (HE) with hollow base and the long-range PALA 37 (Extended Range Full Bore Type) in two versions, hol-



Argentina's 155 mm/45 calibre Long Range Artillery Cannon is expected to have a maximum range of 39 000 m (CITEFA)

low base and base bleed.

Firing the Argentine PACU projectile, which is already in production, a maximum range of 23 000 m can be achieved. With the new PALA 37 hollow base projectile a range of 32 000 m can be achieved, and using the PALA 37 base bleed projectile — still in development — 39 000 m.

A number of improvements over the first prototype are reported. The new 155 mm

CALA 30/2 is mounted on a conventional split trail carriage with auxiliary power. When deployed in the firing position it rests on the two spades and a hydraulic firing jack under the carriage.

The 155 mm/45 calibre ordnance is fitted with a double baffle muzzle brake, screw breech and a fixed recoil system. Elevation limits are from -3 to +67 deg, while traverse is 30 deg left and right.

## International Defence

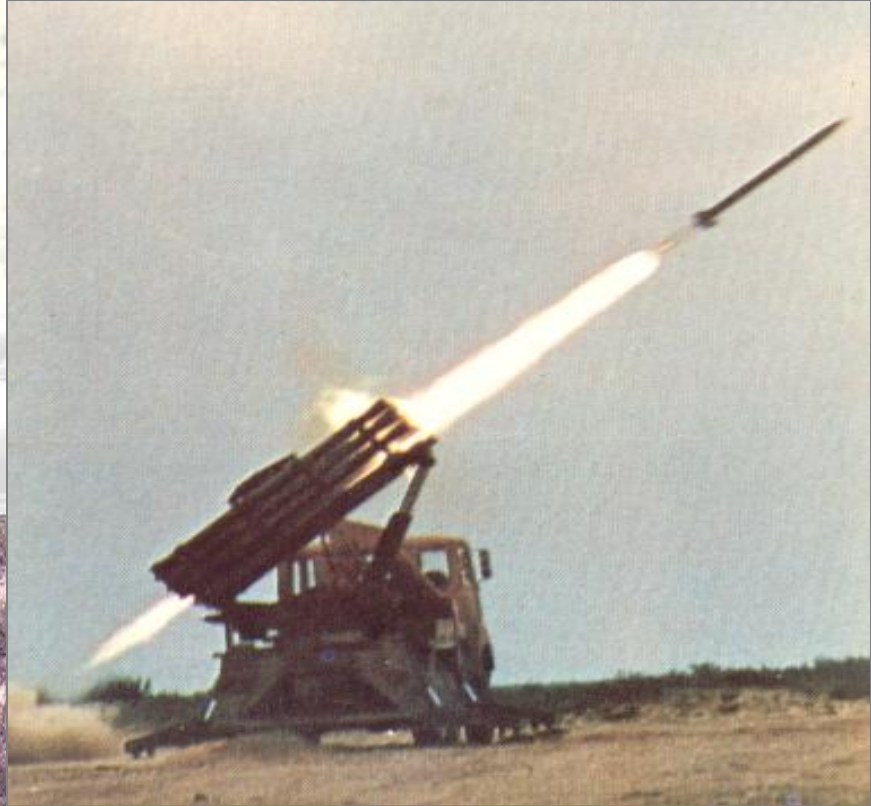


# Cohetes de Artillería















# Sistematización de Munición







# PROYECTILES 155 MM



**M 107**



**S-CX 2**



**PACU**



**PALA 30**



**PALA 37**





**P3**



**PACU**



**M56**





# Sistematización 2000 - Cañón VCA 155 mm L.45



# Alcances



Proyectil Material	M 56	PACU
CITER	20.000	22.100
VCA	24.700	25.100
CALA	22.600	28.400

