

The



Story

**The CJS Story....**

**dedicated to  
its founder**

**Dr. Goh Keng Swee**



## *A page from history . . .*

*In the mid-sixties, Dr. Goh Keng Swee, Minister of Defence engaged the services of an Australian industrial consultant, Sir Laurence Hartnett, over the period from July 1966 to November 1966 to plan the setting up of a small arms ammunition factory in Singapore. The factory was to serve the Singapore Armed Forces for its requirement of small arms ammunition.*

*Sir Laurence Hartnett accompanied, by a team of Singapore technicians, visited some of the leading overseas small arms ammunition factories and equipment manufacturers and, in September 1966 the order for a complete line of machines for the production of small arms ammunition was placed by the Singapore Government with a well known European manufacturer.*

*Chartered Industries of Singapore Pte Ltd., a wholly Singapore Government owned organization was officially registered with the Registrar of Companies in January 1967. Piling work on the ammunition factory complex commenced on a 30-acre site in March 1967 and building construction commenced in April 1967.*

*The small arms ammunition department commenced operations in August 1967 and was essentially producing 5.56mm calibre ammunition for the Singapore Armed Forces. Since August 1967, the Singapore Armed Forces was able to draw its entire requirement of this calibre ammunition from Chartered Industries of Singapore Pte Ltd.*

*Production was aimed at achieving the highest quality laid down by international standards. Regular ballistic tests were carried out daily before the ammunition could be considered for acceptance by the Singapore Army Authorities.*

*In early 1967, the investigation and planning of the Singapore Mint as part of the Company's activities were carried out. The company received technical advice through the services of Mr. R. H. Osbourne as Mint Adviser. Mr. Osbourne, the Superintendent of the Royal Australian Mint in Canberra, was made available to the company under the Colombo Plan Technical Aid Scheme from Australia . . .*

*Among the various personalities that had helped shape the development of CIS and the local defence industry, one person stands out among the pioneers. He is no other than its founder and nurturer, Dr. Goh Keng Swee, who was Minister of Defence at the inception of CIS. CIS today is a translation of his vision into reality . . .*

*History is a reminder . . .*

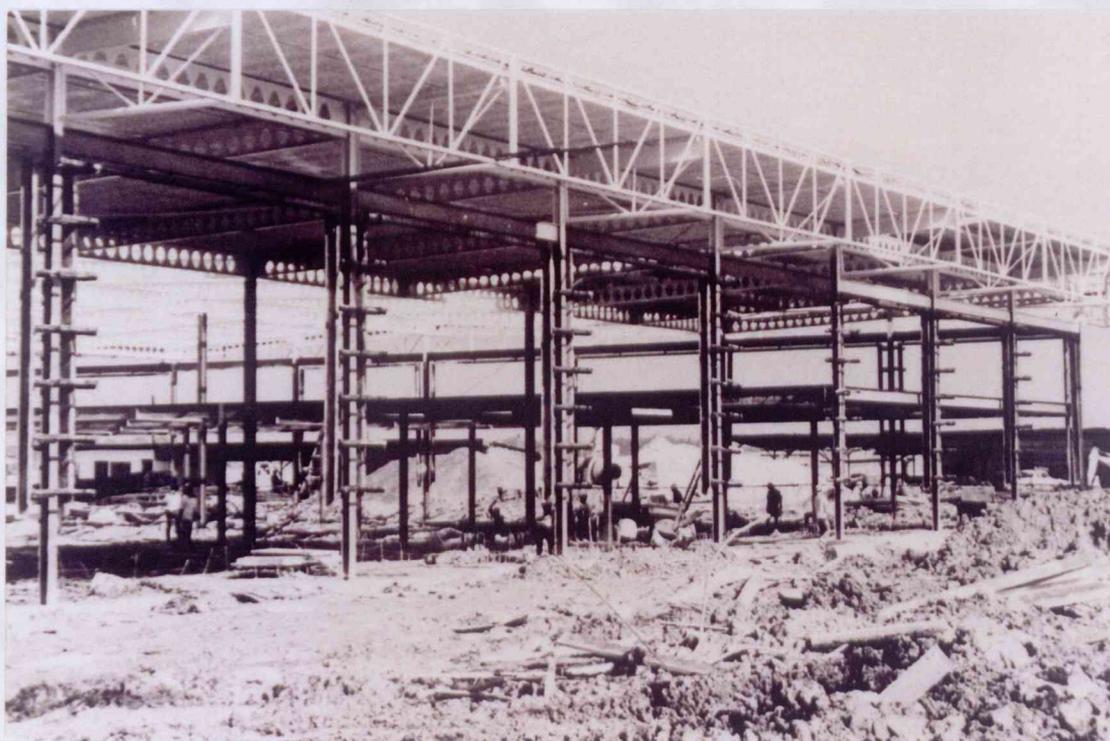
*. . . of the need to be self-reliant, in defence and security . . .  
A credible defence force requires . . . outstanding leadership . . . reliable hardware  
backed by in-country defence technological capability . . .*



*From the swamp-lands of Jurong...*



*... somewhere along Jalan Boon Lay, the foundation was laid...*



*To the jungles of Bukit Timah ...*

*... next to the Pierce Reservoir ...*



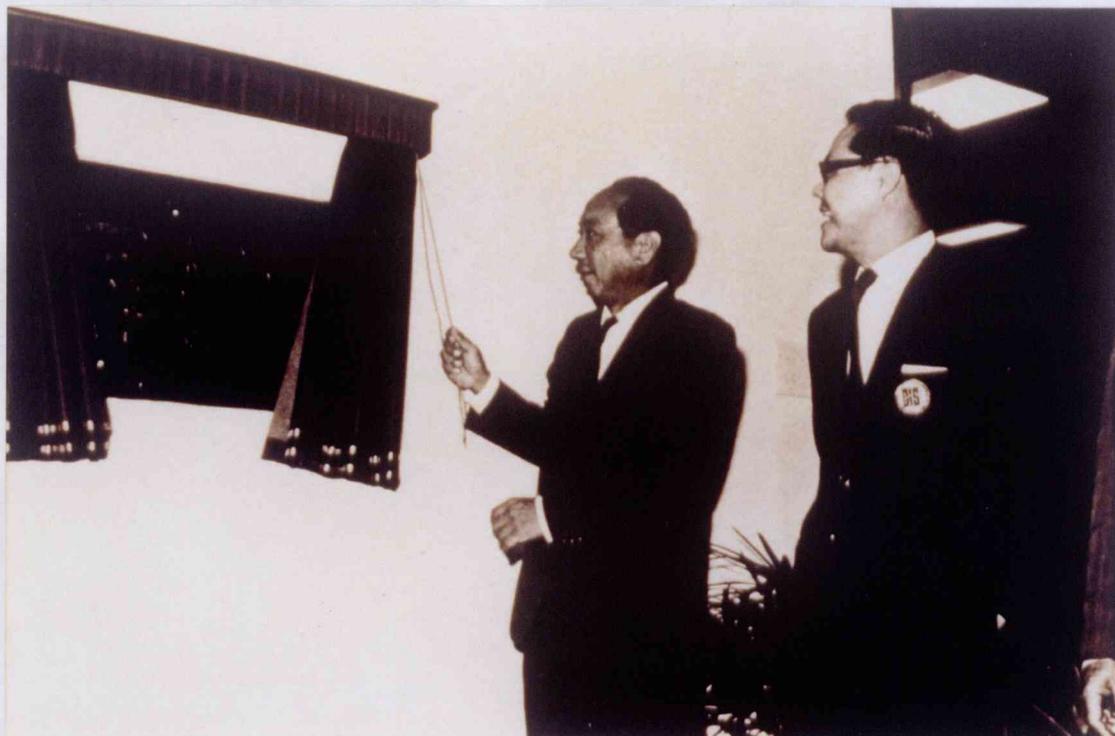
*An emerging technology-based defence production capability ...*

*... sprawled over 200 hectares of land in Jurong, Ayer Rajah, Paya Lebar ...  
with investment in modern facilities now exceeding \$500m ...*



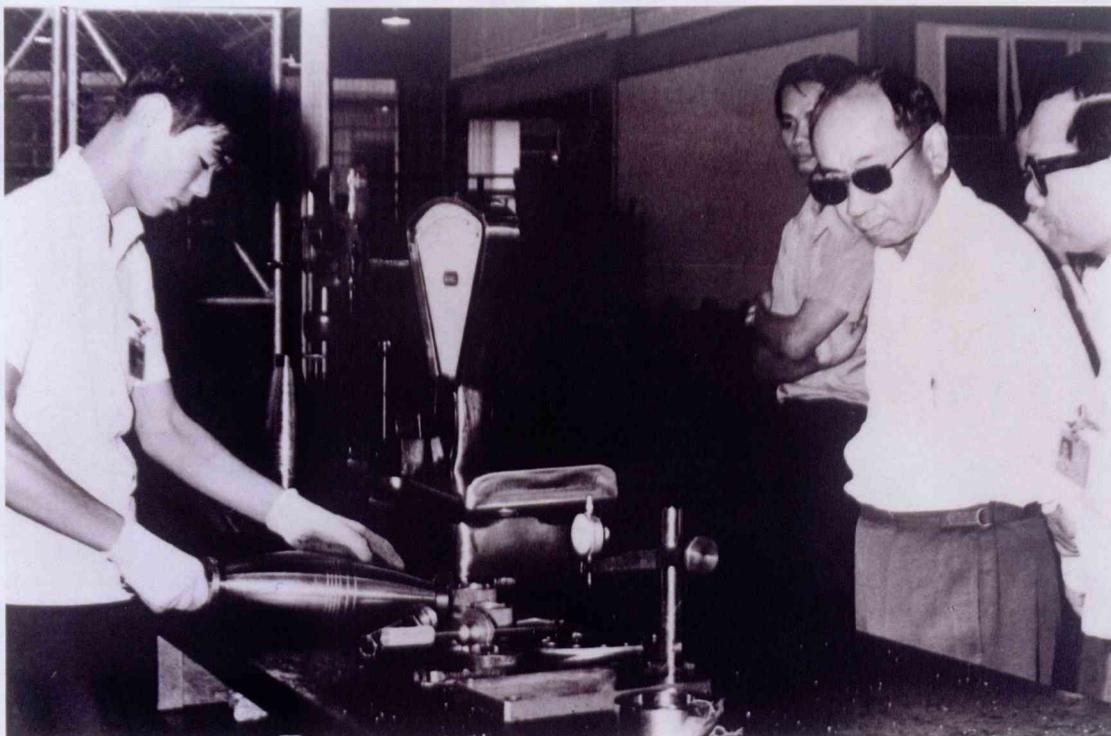
*Chartered Industries of Singapore (CIS) was established ...*

*... incorporated on 27 January 1967 ... and officially opened by the then Finance Minister, Dr. Goh Keng Swee, on 27 April 1968.*

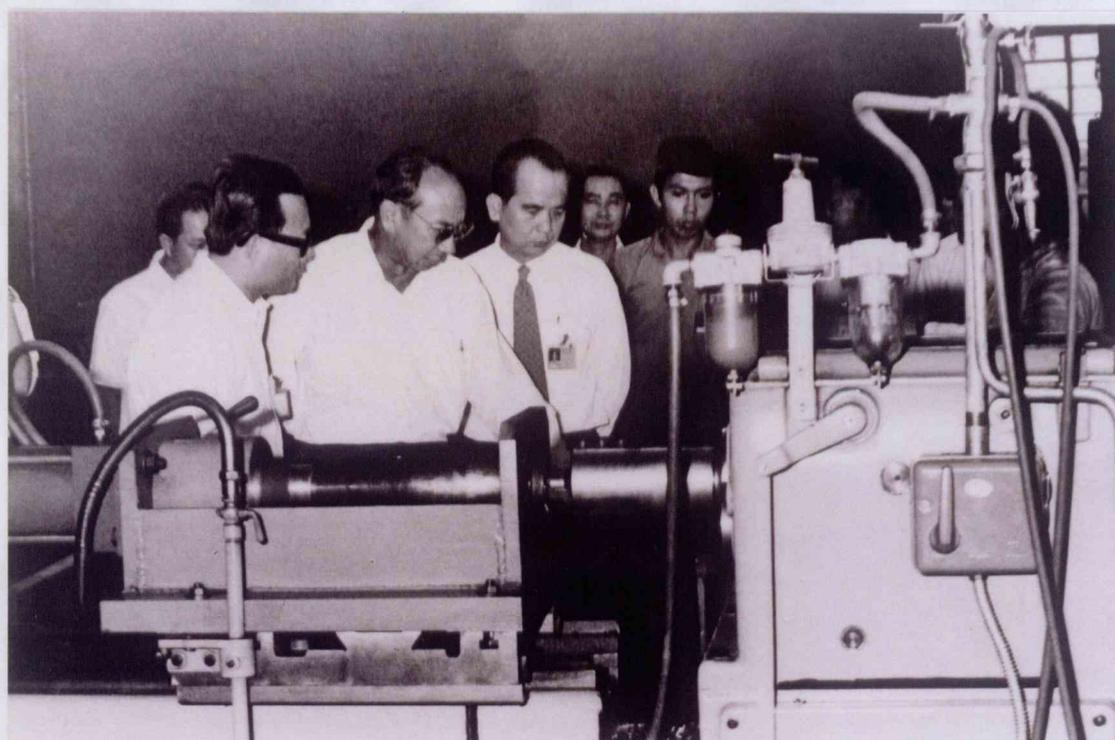


*Early CIS ...*

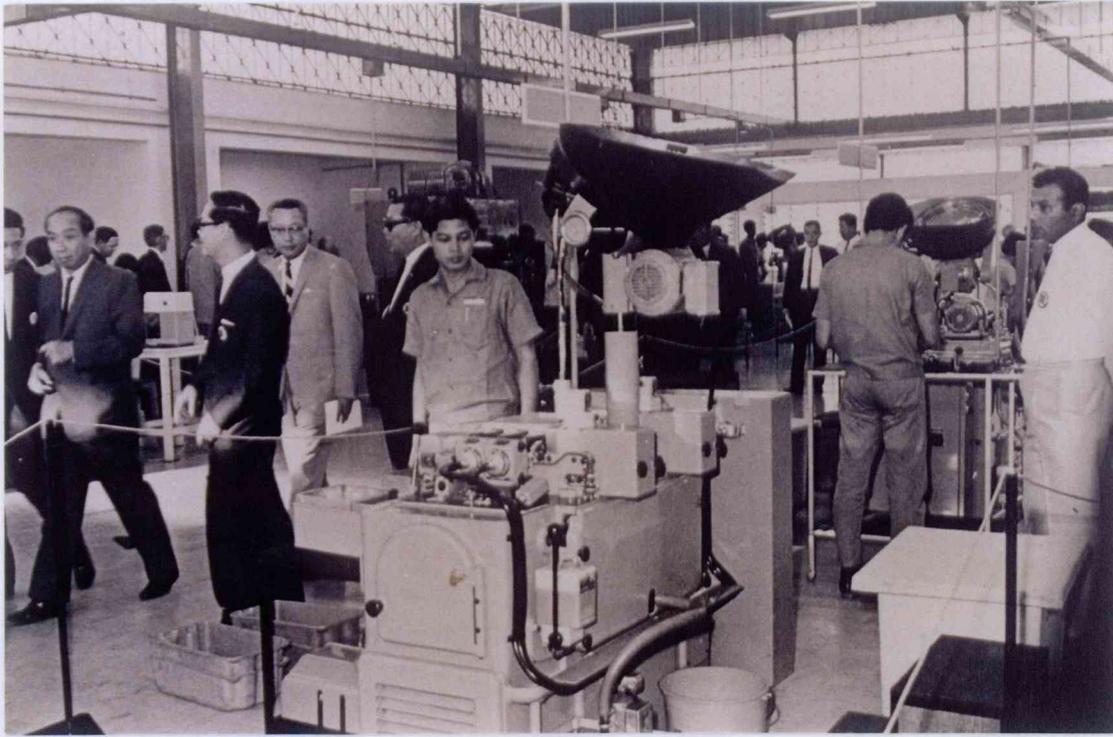
*... in December 1971 ...*



*Early CIS ...*

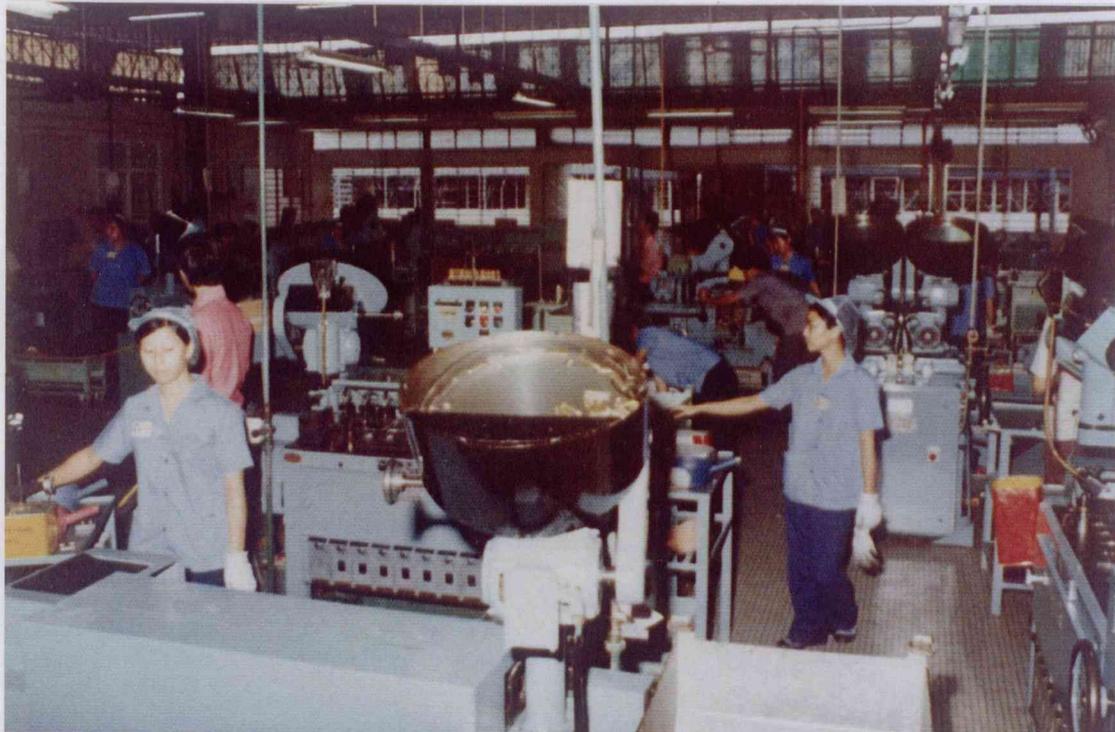


*Early CIS ...*



*Initially producing small arms ammunition for SAF ...*

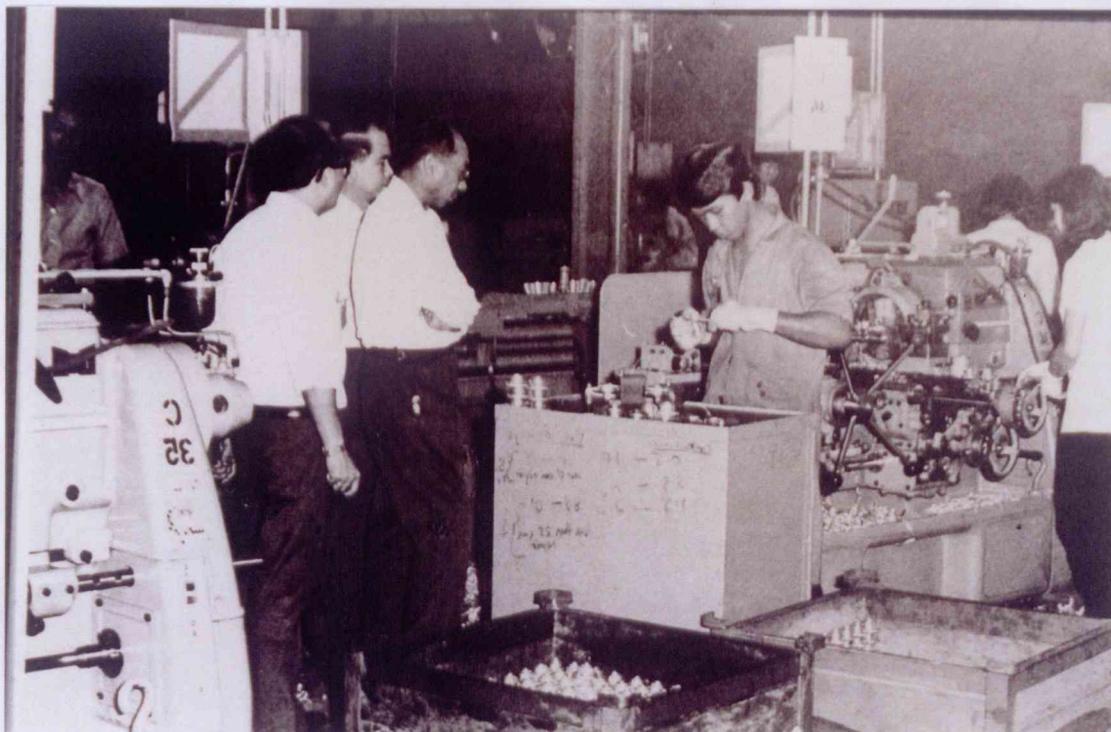
*... and minting coins as well, for our newly independent Republic of Singapore ...*



*The early pioneers of CIS ...*



*... were also  
pioneers of the  
local defence in-  
dustry ...*



*The pioneers ...*

## **PIONEERS OF CHARTERED INDUSTRIES**



*... their hardwork, dedication and loyalty ...*



*The pioneers . . . SAE . . .*

*SAE was established in 1971 . . .*



*. . . their hardwork, dedication and loyalty . . .*



*The pioneers . . . O D E . . .*

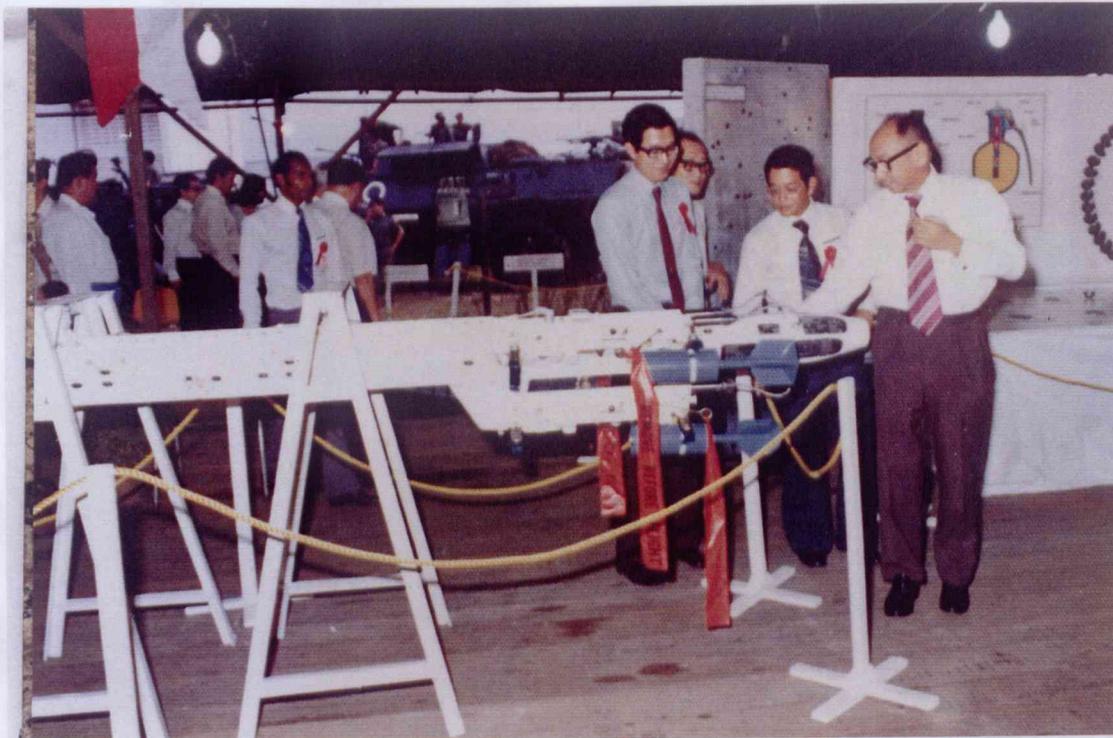
*ODE was incorporated in 1973 . . .*



*ODE was officially opened by Dr. Goh Keng Swee, then Deputy Prime Minister and Minister of Defence, on 26 November 1976.*

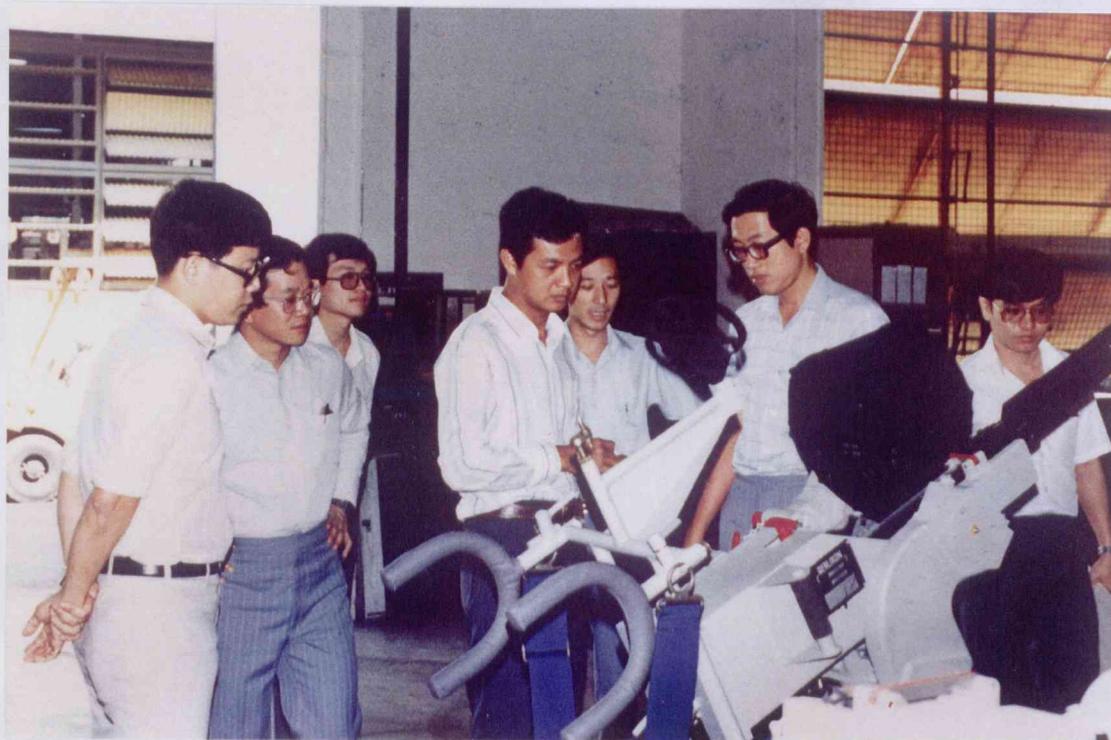


*Early O D E ...*

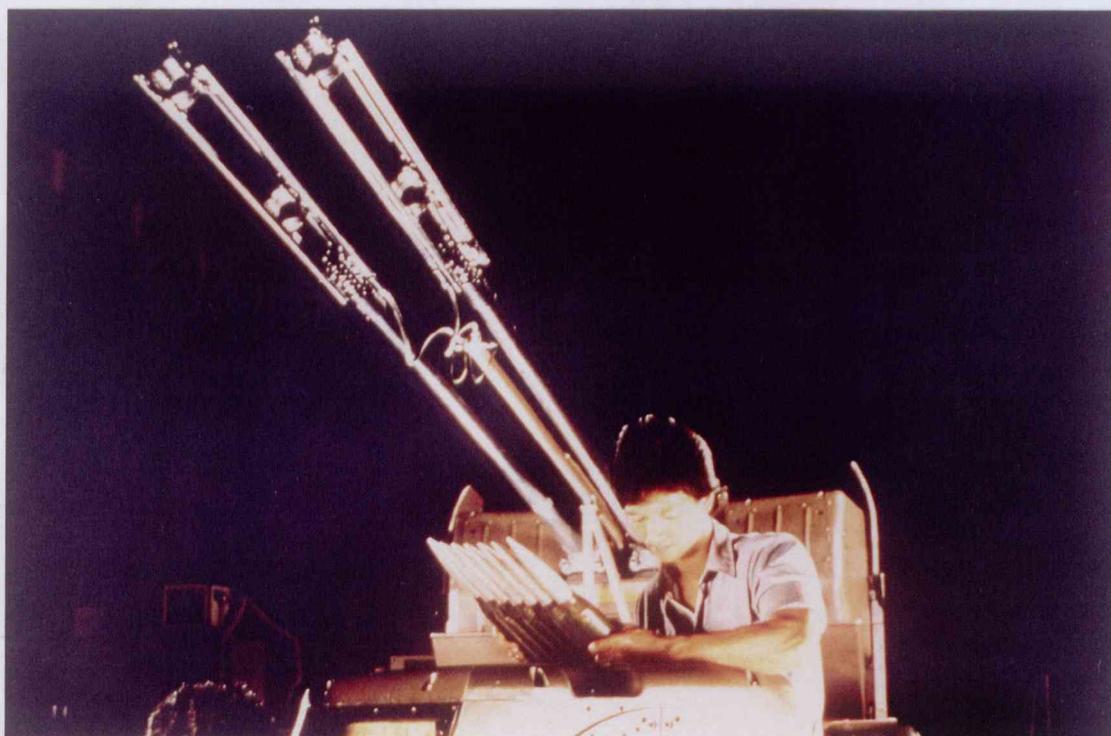


*Combined with superior engineering & technology ...*

*... through licencing arrangements, and other forms of technology transfer ... combined with the talent of its engineers and scientists ...*



*20mm Oerlikon AA gun system*

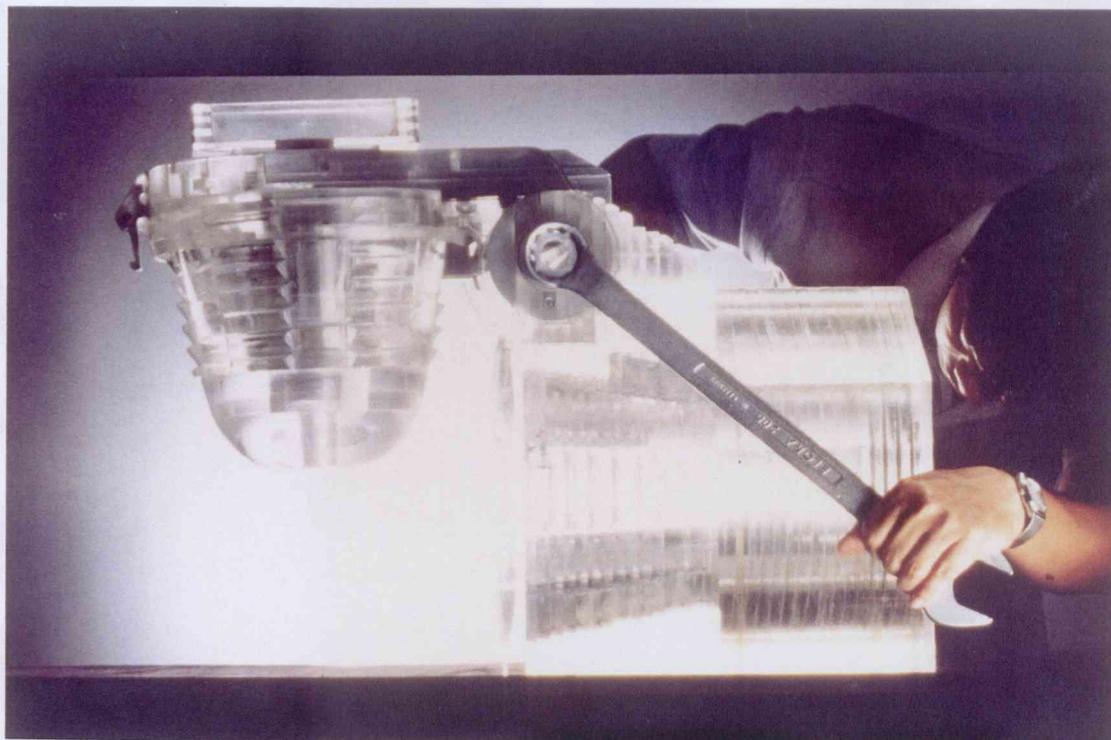


*35mm Oerlikon AA weapon system*

*CIS engineering talent ...*



*Computer-Aided Design & Engineering*



*Breech mechanism for FH-88 howitzer*

*CIS has surged forward . . .*

*. . . into the international league . . . through aggressive marketing overseas*

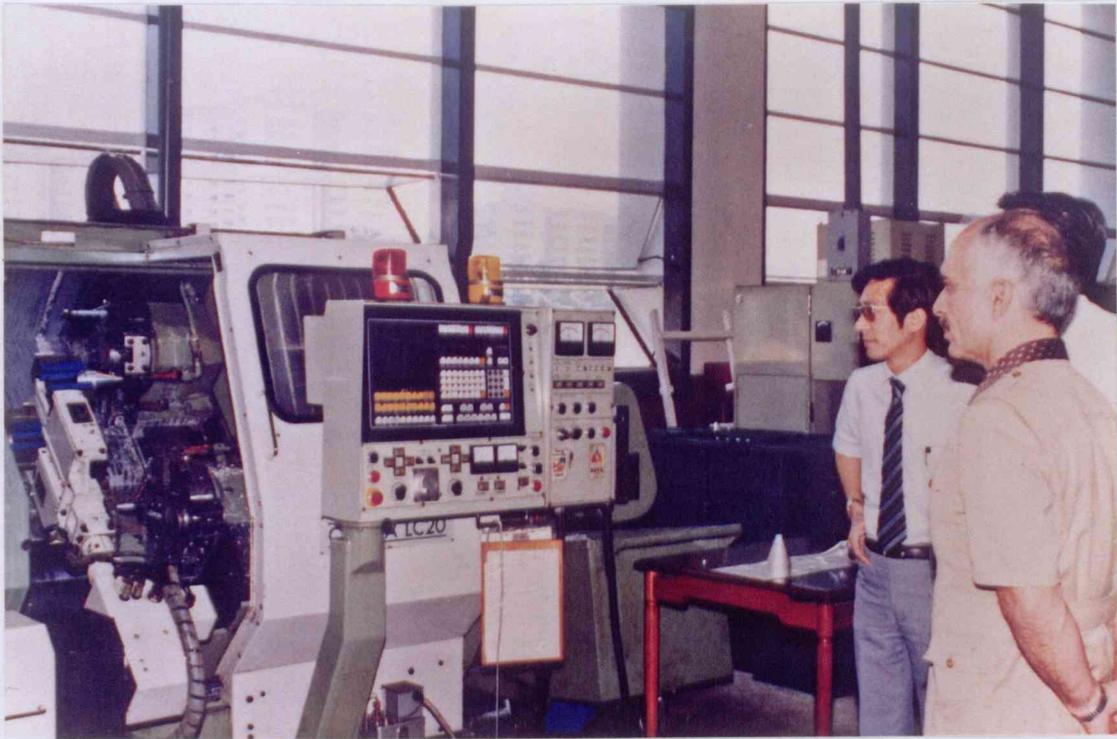
*. . . selling what it can produce over and above domestic needs . . .*



*Overseas marketing*



*CIS, a show-case for Singapore manufacturing industry ...*

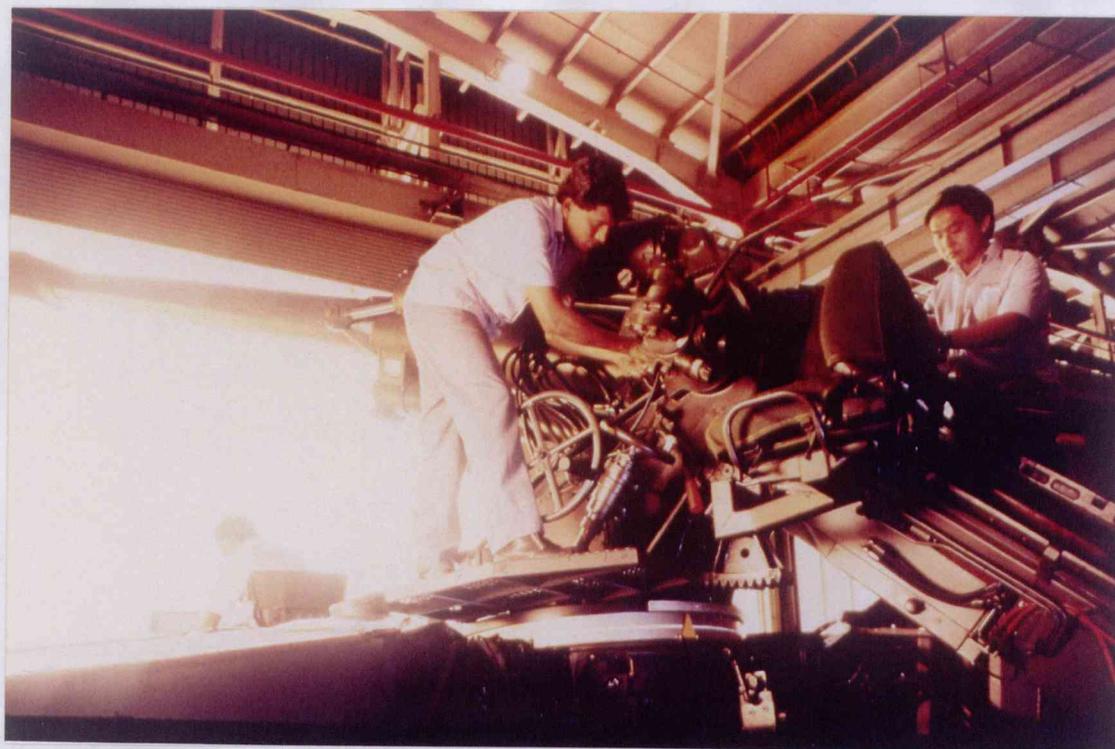


*With quality products . . .*

*. . . including those designed in-house and produced locally . . .*



*Ultimax-100 light machine gun*



*FH-88 Field Howitzer*

*A wide selection of ammunition ...*



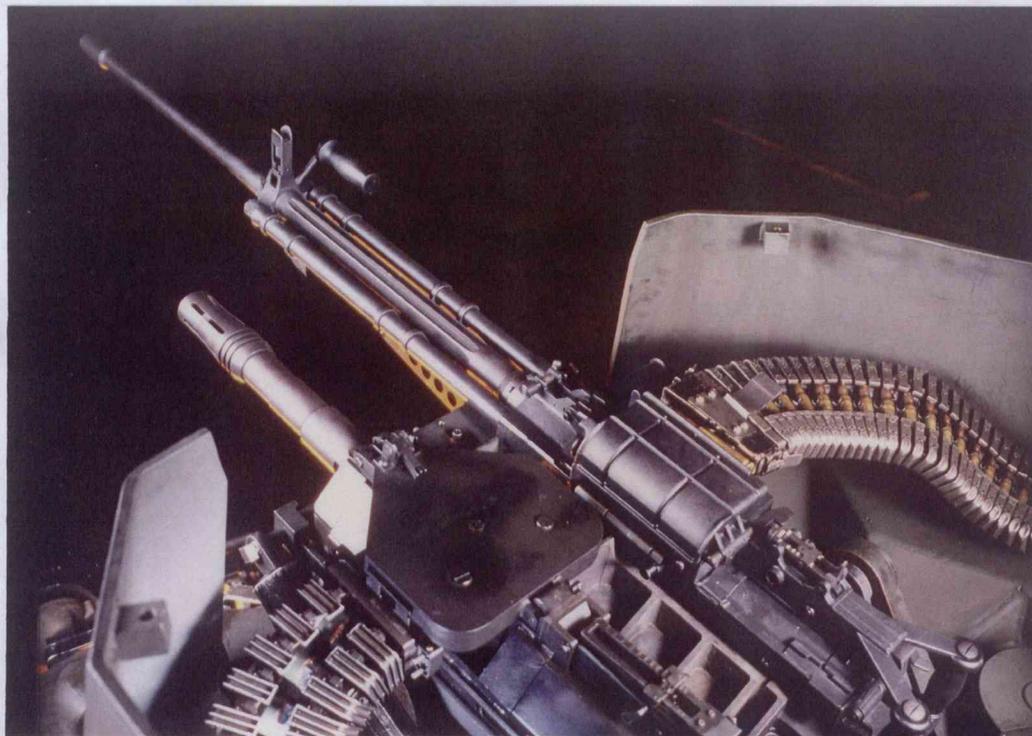
*... from small calibre such as 5.56mm to medium calibre 20mm aircraft ammo, to large calibre 155mm ... with enhanced performance such as extended range, greater accuracy and armour-penetrating ...*



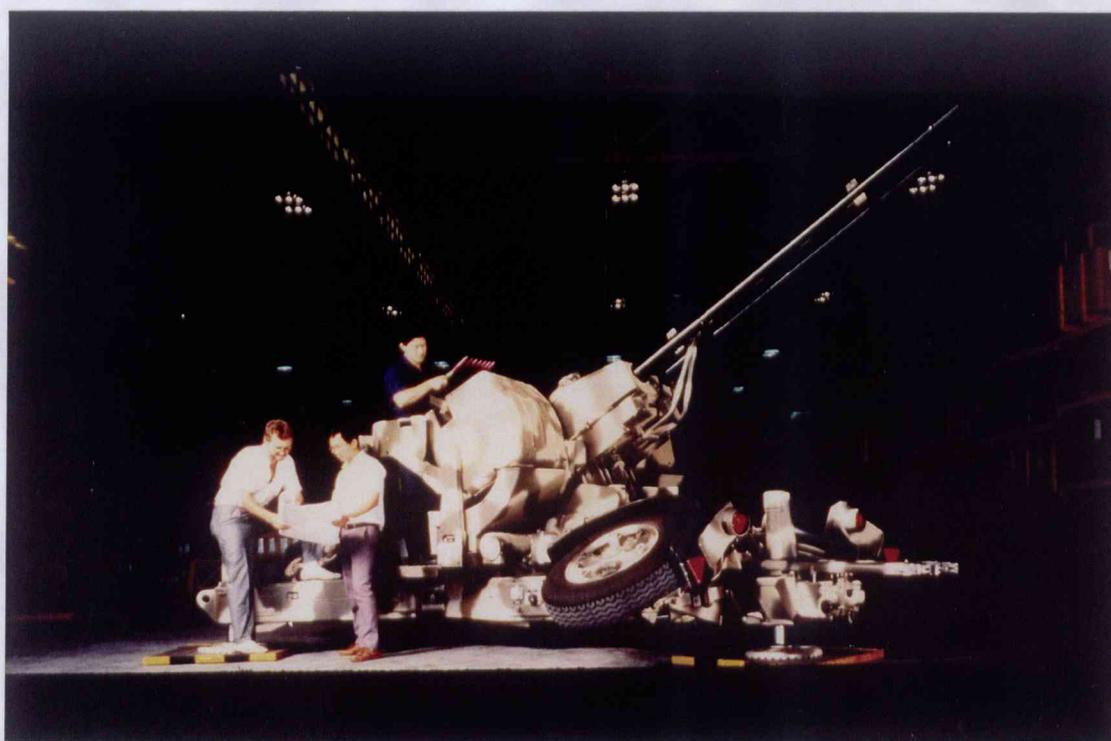
*155mm ER projectile*

*Weapon systems ...*

*... from assault rifles, machine guns, grenade launchers ... to mortars, howitzers and air-defence weapon systems ...*



*40AGL and 50MG weapon system*



*35mm air-defence weapon system*

*Automotive vehicles ...*

*... refurbishment, upgrading and re-manufacture of all classes of vehicles, from trucks to field hospitals, tanks, armoured vehicles and other land platforms ...*



*AMX 13-SM1 tank*



*Class 30 trackway*

*Marketed internationally ...*

*... through its network of overseas marketing offices spanning the  
fire continents ...*

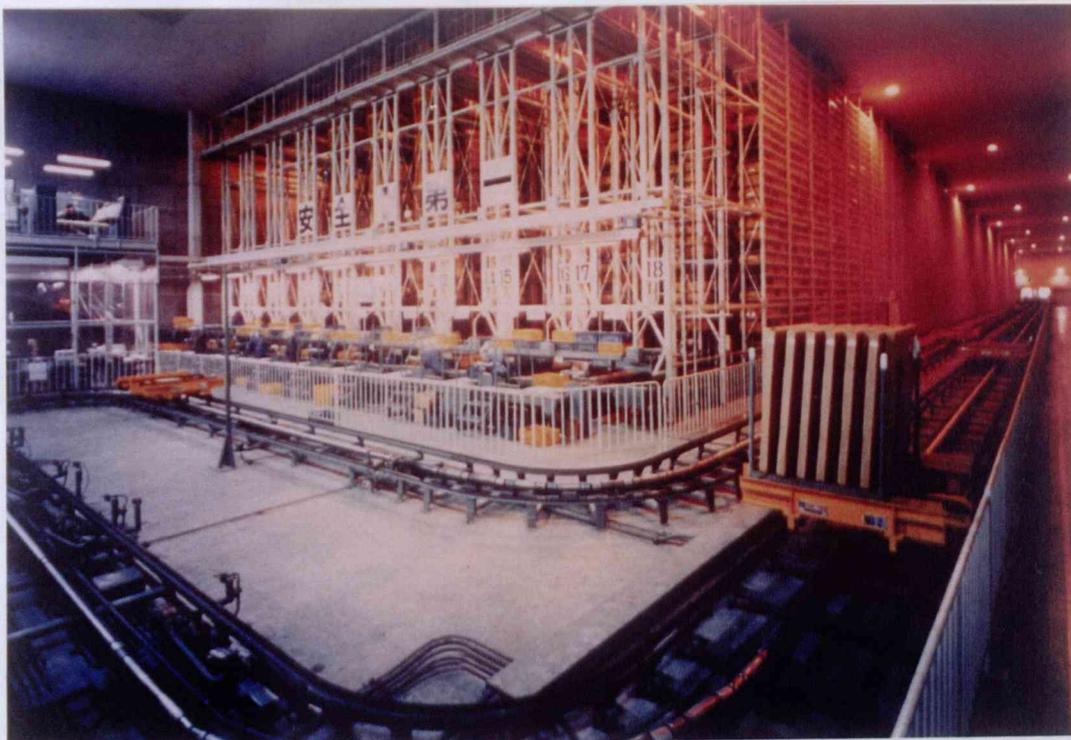


*Supported by own logistic management services ...*

*... computerised network for freight forwarding, procurement and warehousing ... with offices in Los Angeles, London, Hongkong ...*

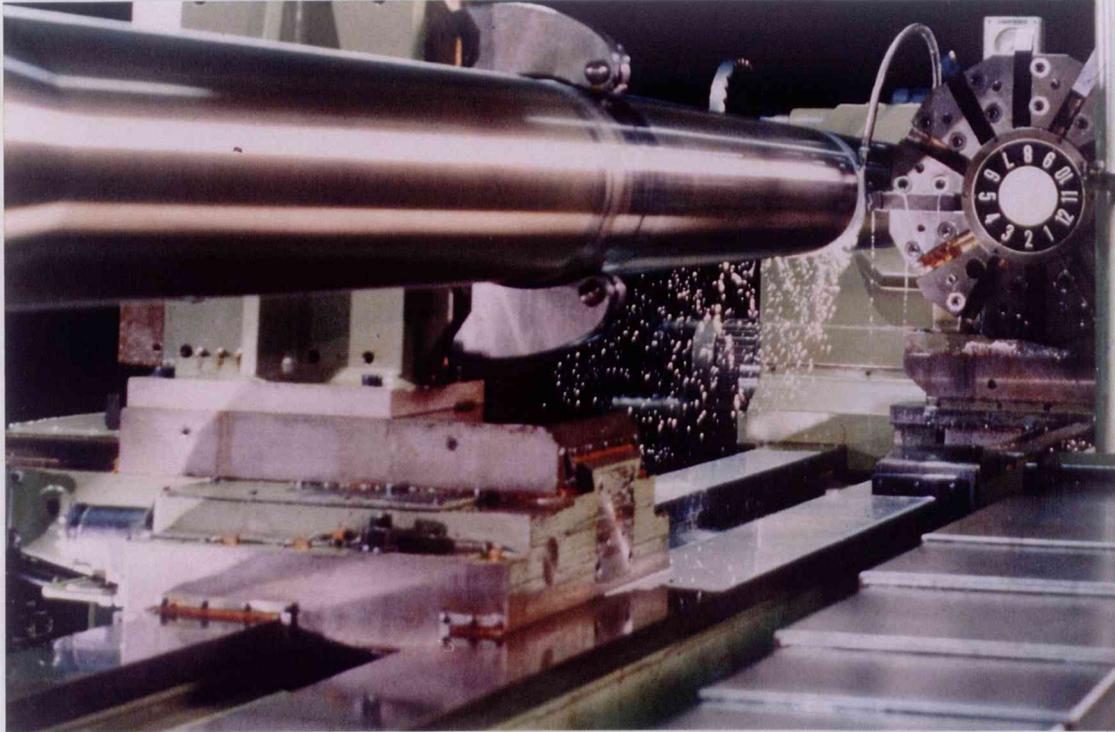


*Automated warehouse*

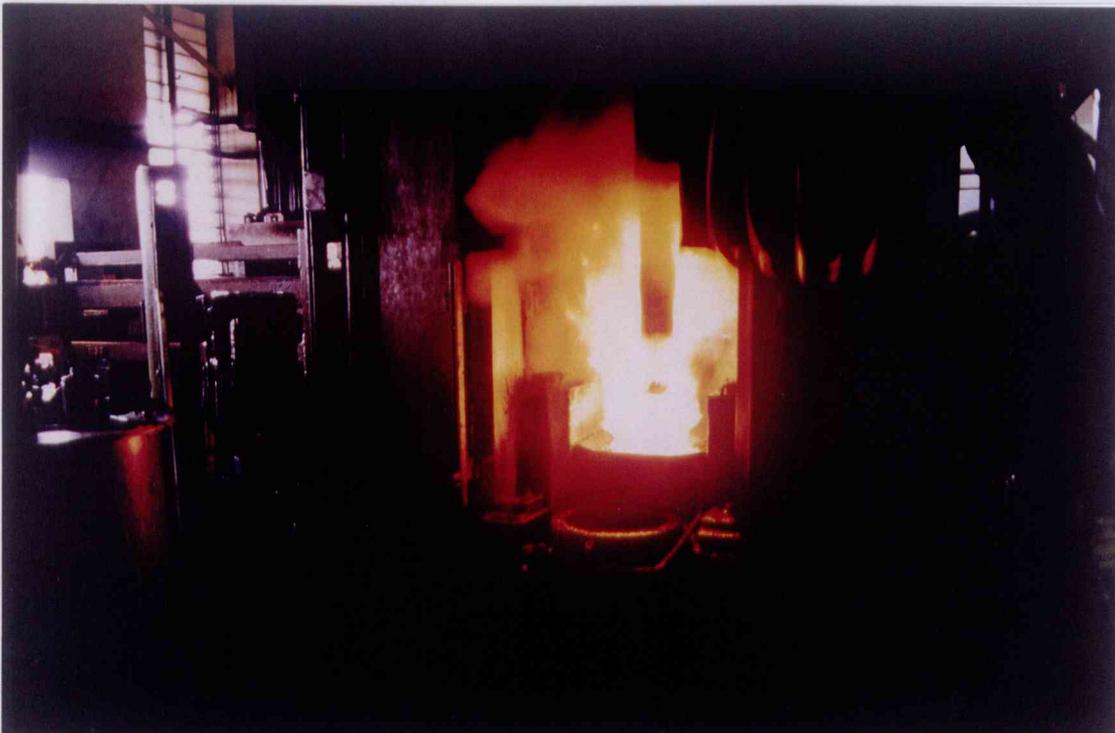


*CIS is a highly specialised manufacturer ...*

*... with core competencies in metalworking & finishing, chemical processing  
and analysis, automotive engineering ...*



*Barrel production*



*Hot forging of shells*

*Highly specialised facilities . . .*



*Scanning electron microscope*

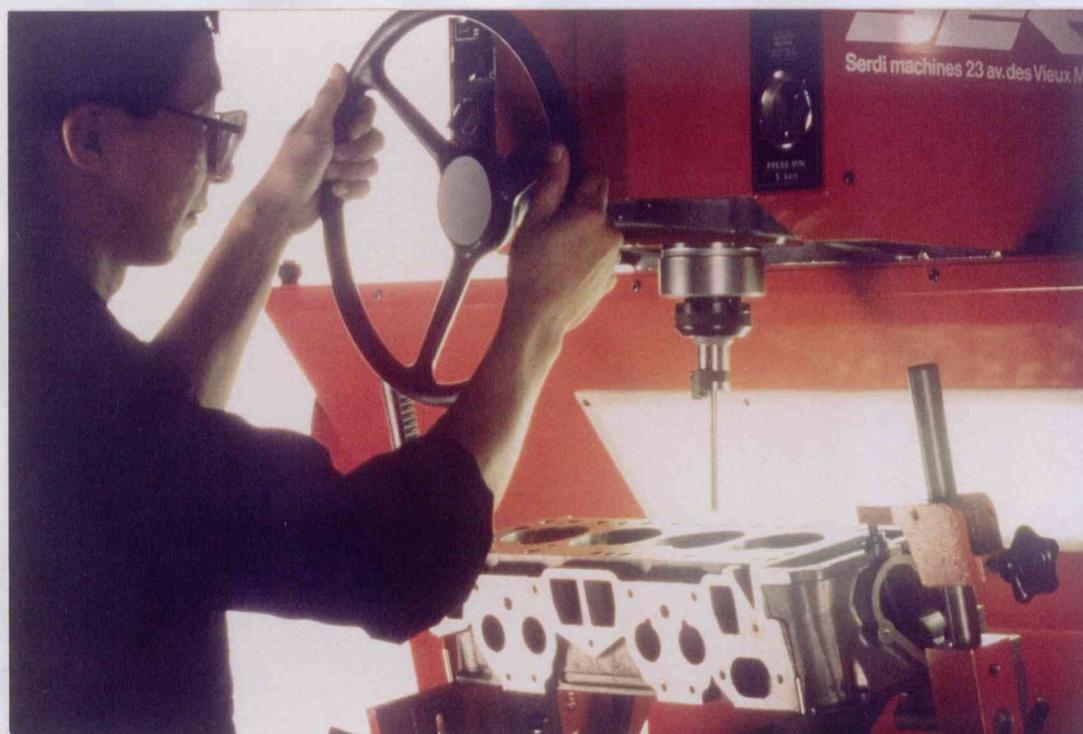


*Chemical analysis*

*Highly specialised facilities . . .*



*Tank retrofit*



*Component re-manufacturing*

*With a heavy bias towards R, D & E ...*

*... a pool of highly specialised scientific & engineering talent ...  
capable of designing, developing, re-engineering and innovating ...*



*CAD-CAM station*



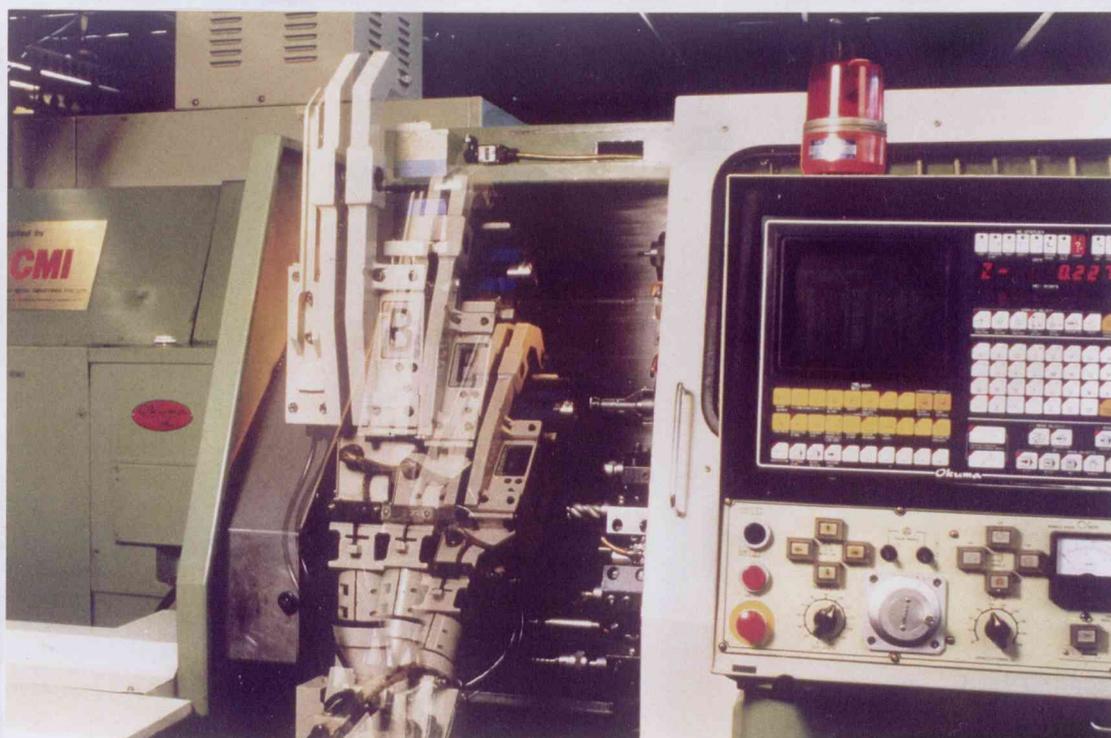
*Explosives laboratory*

*And strongly committed to investment in technology ...*

*... CAD/CAM/CAE, composite materials, electro-optics, signal processing,  
control engineering, factory automation ...*



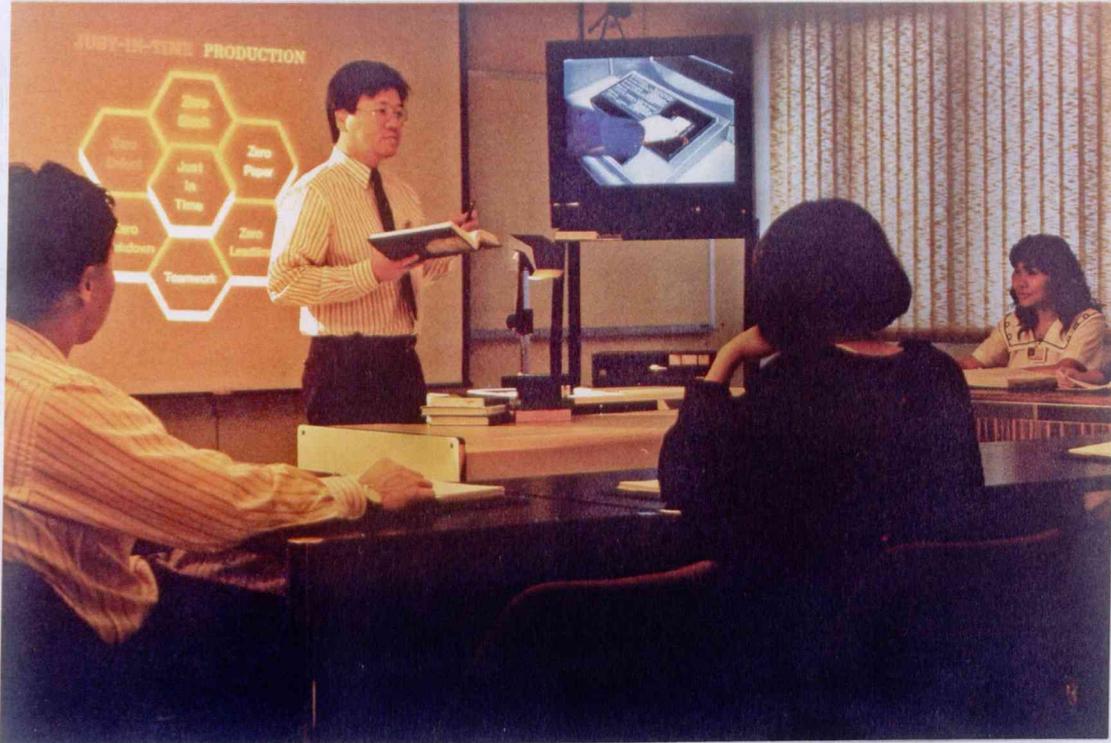
*Opening of Engineering Centre*



*Factory automation*

*And human resource development ...*

*... of its 4,000-odd workforce ... through training and skill development programmes, on-the-job as well as off-the-job ...*



*Training & development*



*CNC machining*

## *Service to community . . .*

*CIS was the first company in Singapore to set up a child-care centre in 1983 . . .*

*Its employees are involved in voluntary community service projects such as blood donation campaigns, visits to old folks' homes . . .*



*22 January 1983*

## **OUTSTANDING CORPORATE CITIZEN AWARD TO CIS**

dedication and commitment to voluntary community work.

Our involvement with charity dates back many years but it was only recently, in the mid-1980s, especially with the advent of Community Chest's SHARE programme, that we started to maintain a record of statistics. The purpose of this record was to enable us to set certain targets



*Award from Singapore Council of Social Service, 19 July 1991*

*Vision to reality ...*

*... building up an in-country ordnance production capability to support Total Defence.*



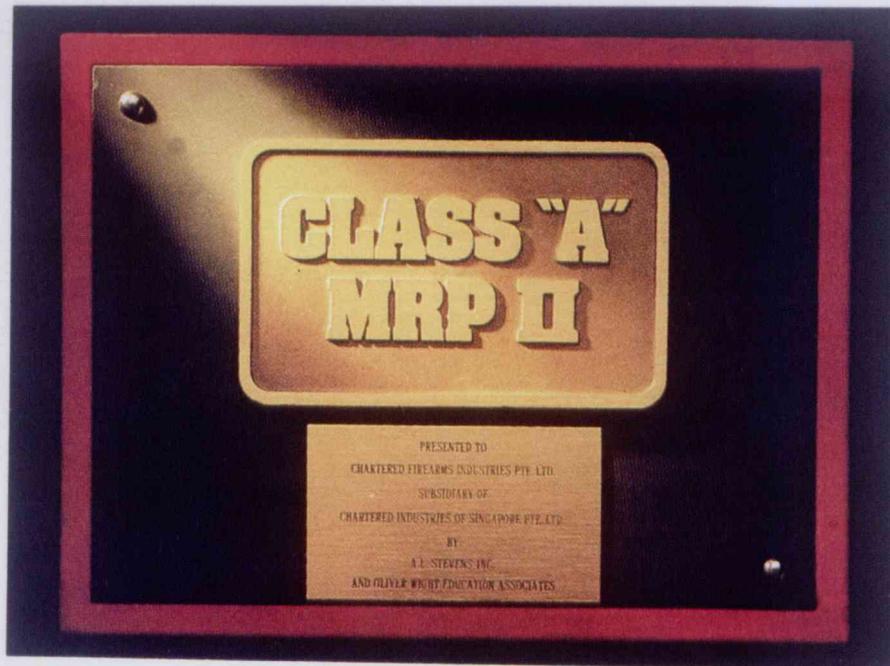
*Flexible automation production line*



*SAE has one of the best equipped automotive workshops in this region*

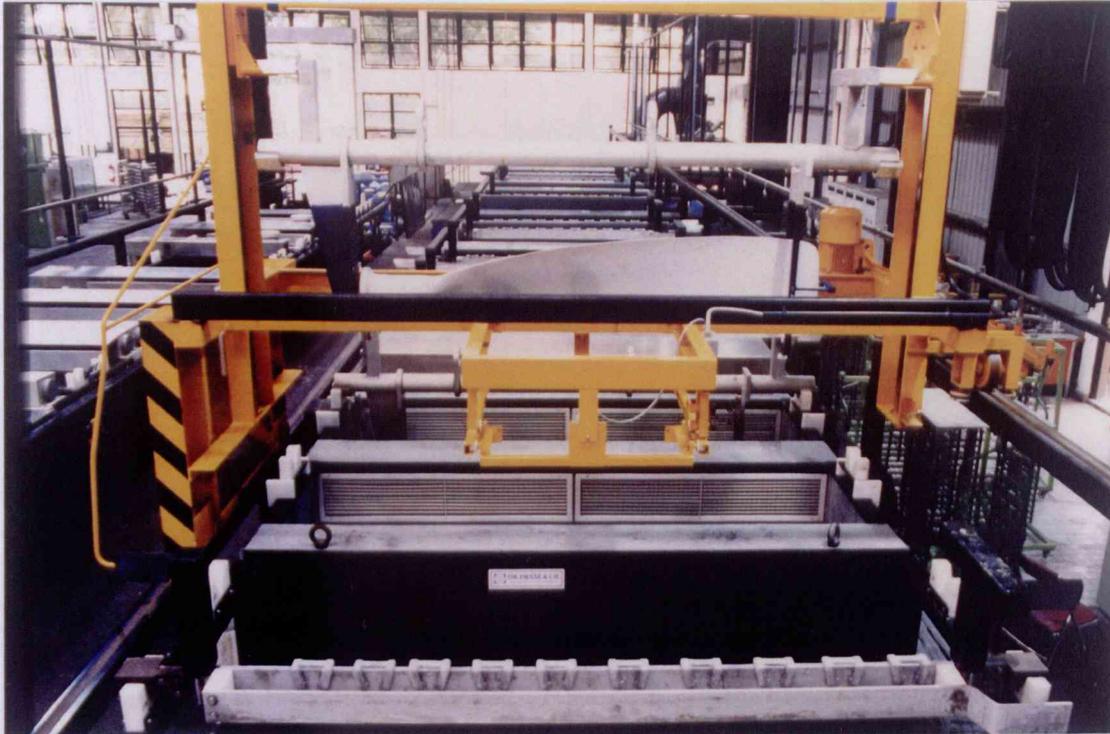
*A sense of purpose and achievement . . .*

*. . . CIS has excelled in areas such as Manufacturing Resource Planning (MRP II) . . . among the first for companies to win National Productivity Award in 1983 . . .*

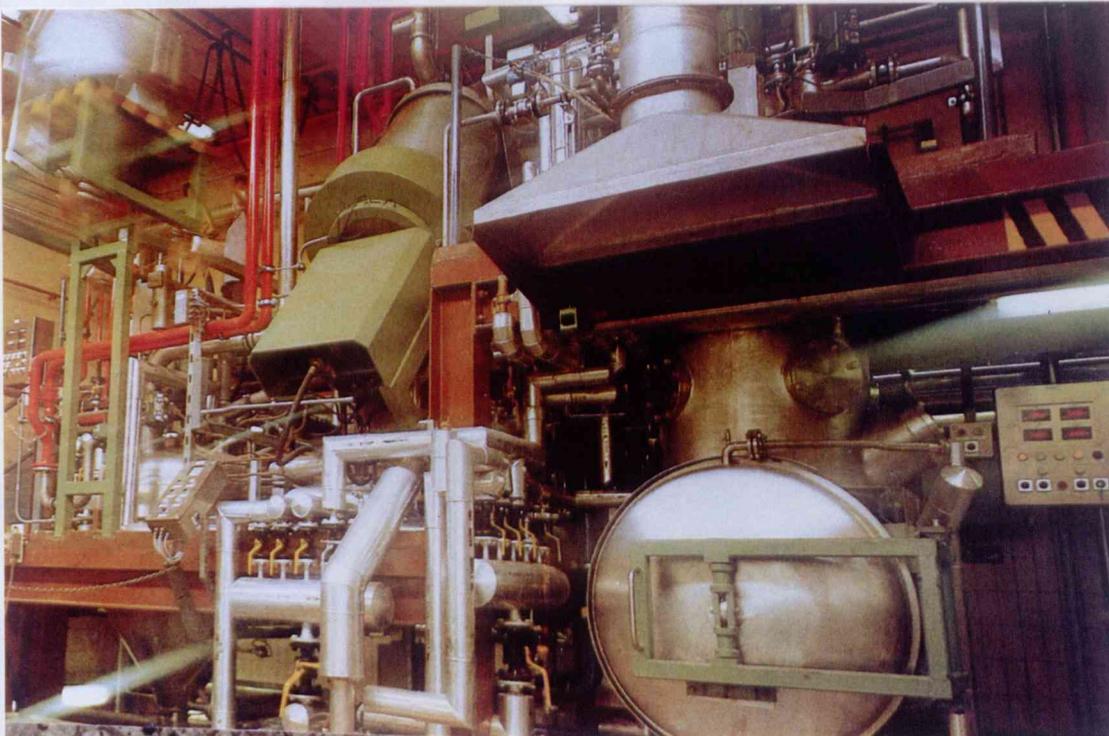


*Presentation of National Productivity Award*

*Ordnance production capability . . .*



*Automated plating line*



*Explosives filling plant*

## 25 years of continual progress . .

### **Proud moments to remember...**

1967 - Production of small arms ammunition commenced at CIS, pioneer of the local defence industry.

1968 - Technical agreement with Oerlikon (Switzerland) to locally manufacture medium calibre ammunition.

1976 - ODE made its first delivery of Bofors (Sweden) guns.

1978 - SAE launched its Autocentre.

- ODE licensed to manufacture the Oerlikon 20mm anti-aircraft weapon system.

1983 - CFI unveiled Ultimax 100, reputed to be the lightest machine gun in the world.

- CIS was among the first few companies to win the National Productivity Award.



1984 - CIS became the first company in Asia to be awarded a Class "A" in Manufacturing Resource Planning (MRPII).

1985 - ODE started to manufacture the Oerlikon 35mm anti-aircraft weapon system.



1987 - Assembly of Oto Melara's (Italy) 76/62mm naval gun system began at ODE.



1988 - The first upgraded AMX-13 SM1 tanks rolled out from SAE.

- ODE delivered the first FH-88 155mm field howitzers.

1989 - CIS teamed up with Bendix Avelex (Canada) to develop and manufacture thermal imagers.

- CFI launched the SR88A assault rifle.

- STS became the first company in the region to qualify for Class I Certificate, by General Dynamics and Pratt & Whitney, in "Failure Analysis" of aircraft components.

1990 - UI inaugurated Pacific Flight Services which offers tow targetting, executive charters and air medical evacuation.

1991 - AOS formed a joint venture with Thomson-CSF to locally manufacture the 40mm L70 proximity fuze and PFHE round.

- SAE was listed with the Stock Exchange of Singapore Main Board.

- CIS selected for the Outstanding Corporate Citizen Award.

1992 - CIS celebrates its Silver Jubilee!

*CIS, the technology leader ...*

*... of the ordnance industry in the region ...*

THE STRAITS TIMES, FRIDAY, JUNE 19, 1992

# CIS: From small player to top gun

**S'pore's arms-making firm in top 10 list**  
*Jane's Defence Weekly names CIS as one of world's leading small arms producers*

By Felix Soh

IT IS one of the lightest and most user-friendly light machine-guns available today — and is entirely "made in Singapore", from the barrel right down to the 100-round drum magazine.

The much-awaited locally developed Ultimax 100 light machine-gun reflects Chartered Industries of Singapore's swift leap within 25 years from the manufacturing of arms under licence to the designing, engineering and manufacture of world-class weapons.

The weapon, combat-proven to have a high hit probability even on the run, is the only machine-gun that can be fired accurately on full-automatic from the hip — even with only one hand.

It can also be fired with the butt removed, a big plus when fighting in cramped, urban areas.

CIS is the ordnance sector of Singapore Technologies

... factor of this weapon which has seen service in several countries.

Furthermore, as a result of interest shown, CIS embarked on a major upgrading of the Armbrus further enhance its performance.

Currently, it is holding discussions with Royal Ordnance of the United Kingdom, another leading howitzer manufacturer, to develop and produce locally a 105mm Light Towed Howitzer (LTH).

The Singapore-made LTH can be ferried by helicopters for rapid deployment forces.

Another strategy is to build a second-hand weapon and refurbish it to improve its performance and extend its length of its useful life.

An example is the AMX 13 SML. After four years of research, development and trials, the Singapore Armed Forces and Singapore Automotive Engineering — a CIS subsidiary — came up

... units. This type of weapon — which automatically launches high-explosive grenade projectiles up to 2,000 m — was called the "small-arms hero" by the US

... unlike the CIS weapon.

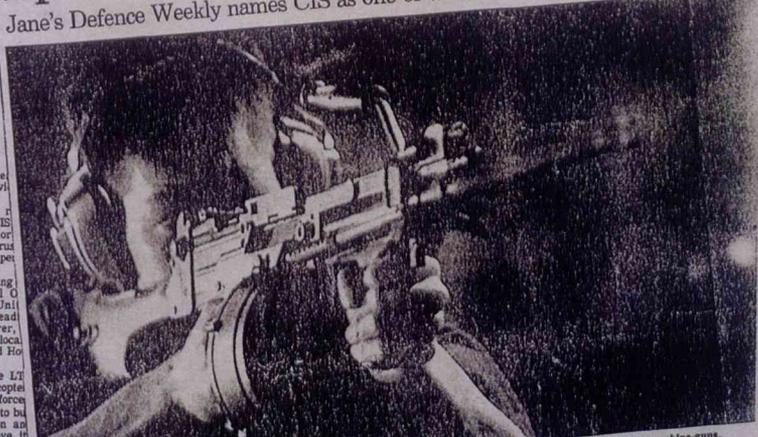
Another Singapore-developed weapon, the Ultimax 100, has gained international recognition as one of the lightest machine-guns in the world, based as an infantry

IN!

■ CIS — F player t

By Felix Soh

Firepower ... the Ultimax 100, a Singapore-developed weapon that is one of the world's lightest and most accurate machine-guns.




*FH-88 Field Howitzers*

