

# ARCHIVED REPORT

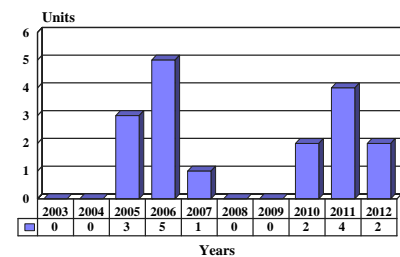
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## 105/14 Model 56 105 mm Pack Howitzer - Archived 5/2004

### Outlook

- Production on as-needed basis for export
- The Model 56 continues to be promoted as the lightest system of its type
- Model 56's unique qualities should ensure at least one additional sale
- There is no modernization or retrofit potential

10 Year Unit Production Forecast  
2003 - 2012



### Orientation

**Description.** A towed 105 millimeter artillery system.

**Sponsor.** Funding for the initial development and Italian procurement of this artillery piece was provided by the Italian Ministry of Defense. Further development has been funded by the prime contractor Oto Melara.

**Contractor.** The 105/14 Model 56 105 millimeter Pack Howitzer was developed by offices of the Italian Army and is manufactured by Oto Melara SpA, La Spezia, Italy. This firm is a component of the Finmeccanica organization.

**Licensees.** None, although the People's Republic of China has manufactured an artillery system that is almost identical to 105/14 Model 56 Pack Howitzer; in fact, Oto Melara supplied two 105/14 Model 56 pieces to China early in the 1980s.

**Status.** The 105/14 Model 56 Pack Howitzer is in production on an as-needed basis; this artillery piece is in widespread service around the world.

**Total Produced.** As of 2003, a total of 2,586 105/14 Model 56 Pack Howitzers had been fabricated for service deliveries.

**Application.** A light, close-support artillery system primarily for light infantry with minimal or no truck assets. The Model 56 can be quickly broken down into 11 components for easy transport by pack animal; therefore, it can be used by mountain troops. This weapon also has a direct fire capability.

**Price Range.** In equivalent 2003 United States dollars, the 105/14 Model 56 105 millimeter Pack Howitzer has a unit price of \$219,000 in a 10-unit buy. This artillery piece has been traded on the open market by brokers and principals at the equivalent of \$68,000.

### Technical Data

**Design Features.** Among the lightest 105 millimeter artillery systems available today, the Model 56 can be broken down into 11 pieces for transport by draft animals.

**Crew.** Seven

**Muzzle Brake.** Double baffle.

**Recoil System.** The Model 56 uses a combination hydropneumatic (buffer) and mechanical (recuperator) system.

**Breech Mechanism.** Vertical sliding wedge.

**Carriage Type.** Split trail.

**Dimensions.** The following data are for the latest production example. The data in parentheses are for when the piece is operated in the direct fire mode.

	<u>SI units</u>	<u>US units</u>
Caliber:	105 millimeters	4.13 inches
Length overall:	4.8 (4.7) meters	15.74 (15.42) feet
Barrel length:	14 calibers - 1.478 meters	14 calibers - 4.85 feet
Width:	2.9 (4.0) meters	9.51 (13.12) meters
Weight:	1.29 tonnes	1.42 tons

**Performance.** The range figure is with the M1 High Explosive round. The Model 56 is normally towed at around 60 kilometers per hour (37.3 miles per hour) by a Land Rover class vehicle.

	<u>SI units</u>	<u>US units</u>
Elevation:	+65° (25)°	+65° (25)°
Depression:	-5°	-5°
Traverse:	18° (28°) left/right	18° (28°) left/right
Maximum range:	10,575 meters	11,564.8 yards
Maximum rate of fire:	8 rounds per minute	8 rounds per minute
Sustained rate of fire:	3 rounds per minute	3 rounds per minute

## Variants/Upgrades

**Variants.** None have been developed and none are expected; minor improvements have been incorporated as production cut-ins.

**Modernization and Retrofit Overview.** No programs of this type have been developed for the 105/14 Model 56 and none are expected.

## Program Review

**Background.** Where some other nations with mountainous or rough terrain feel that they can get by without specialized equipment, Italy has long believed that a specially designed pack or mountain howitzer is a necessity in its inventory. While Italy had received some M116 75 millimeter Pack Howitzers from the United States in the late 1940s, an indigenous weapon in a larger caliber was desired. To that end, in 1953 the Italian Ministry of Defense and Army began developing such a weapon. Then Oto Melara firm, a major player in the armaments industry since World War II, assisted in the development program and was selected to manufacture the piece. The serial production of the Model 56 began in 1957 at the La Spezia facility. Since the Model 56 was the only system of its type available as new production, it became rather popular on the export market. Today, at least 40 nations have the piece in inventory. In 1994, Oto Melara became a component of the Finmeccanica group.

**Description.** The Model 56 is a lightweight pack or mountain howitzer that is easily dismantled into 11 pieces for transport by draft animal; the heaviest piece weighs 122 kilograms (268.4 pounds). The total weight of 1.29 tonnes (1.42 tons) is significantly less than that of any other 105 millimeter howitzer. This light weight and ability to be dismantled means that the Model 56 can be towed or transported on the beds of the lightest military vehicles of the Land Rover/Jeep class, or by small helicopters, small boats, or draft animals. The weapon is designed so that it can be used in an indirect fire mode or as a direct fire weapon.

The carriage assembly consists of the undercarriage, upper and lower recoil assemblies, two balancing springs, two sights, optional two-part shield, cradle, and saddle. The two sights are an indirect-fire sight mounted on the left and a direct-fire sight mounted on the right. The two trails, which fold for towing, are attached to the undercarriage assembly. The Model 56

can be set to two different positions for indirect or direct fires. This involves two different heights on the trunnion axes and two different wheel tracks. Rack and pinion gears are used for elevation and traverse.

The barrel assembly consists of the 14 caliber barrel, breech ring, muzzle brake, and slipper assembly. The slipper is used to increase the weight of the recoiling mass and to stabilize the piece. The Model 56 uses a percussion-type firing mechanism with firing by hand lever or by lanyard.

General Comments on Pack Howitzers. When the serial production of the Model 56 went dormant in 1990, most analysts believed that the system would no longer be produced. Some observers even went so far as to state

that mountain or pack howitzers had no place in this day of laser weapons and stealth bombers. However, we have always felt that a few of the world's 175 or so military organizations will always have a need for pack artillery such as the Model 56, and the two orders from Brazil in the 1990s proved the continuing demand for this unique technology. That demand is also indicated by the fact that the Chinese have apparently made a direct copy of the Model 56 to address their perceived need. While this is undoubtedly a thorn in Oto Melara's side, imitation is the sincerest form of flattery. With the growing interest in rapid deployment forces, interest in pack or mountain howitzers can be expected to increase, or at least remain steady, for the foreseeable future.

## Funding

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The Italian Ministry of Defense provided initial developmental and procurement funding for the Model 56.

## Recent Contracts

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No contractual information related to the Model 56 has been released.

## Timetable

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This timetable relates to the 105/14 Model 56 Pack Howitzer only and not to the M3 pack howitzer.

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1953	Development of 105/14 Model 56 Pack Howitzer begins
	1957	Serial production of 105/14 Model 56 Pack Howitzer begins
Early	2003	Manufacture continues on an as-needed basis

## Worldwide Distribution

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Export Potential. The Model 56 has long been the only new-production pack artillery chambered for Western pattern ammunition. Because of this and the limited demand, Oto Melara should continue to be the major source for 105 millimeter pack or mountain artillery.

Chinese Connection? In 1997, the People's Republic of China revealed that it had been manufacturing a new 105 millimeter pack howitzer and began offering the piece on the export market. In appearance, this piece is identical to the 105/14 Model 56. In fact, two Model 56 pieces were purchased by the People's Republic of China in the early 1980s, but no follow-on procurement ever occurred. It is not known whether any licensing agreement has been made between the prime contractor Oto Melara and the People's Republic of China.

Countries. As of early 2003, the worldwide inventory of the Model 56 was as follows:

<u>Africa</u>		
	<b>Botswana</b>	4
	<b>Burkina Faso</b>	2
	<b>Djibouti</b>	1
	<b>Ethiopia</b>	2
	<b>Kenya</b>	8
	<b>Morocco</b>	16
	<b>Nigeria</b>	200
	<b>Somali Republic</b>	89
	<b>Sudan</b>	24

	<b>Zambia</b>	18
	<b>Zimbabwe</b>	9
<u>Asia</u>	<b>Bangladesh</b>	30
	<b>India</b>	242
	<b>Indonesia</b>	10
	<b>Malaysia</b>	150
	<b>Nepal</b>	14
	<b>Pakistan</b>	50
	<b>People's Republic of China</b>	2
	<b>Philippines</b>	12
	<b>Thailand</b>	12
<u>Australia/New Zealand</u>	<b>Australia</b>	21
	<b>New Zealand</b>	8
<u>Europe</u>	<b>Belgium</b>	2
	<b>Bosnia-Herzegovina</b>	3
	<b>Croatia</b>	2
	<b>Cyprus</b>	54
	<b>France</b>	28
	<b>Germany</b>	19
	<b>Greece</b>	18
	<b>Italy</b>	272
	<b>Macedonia</b>	2
	<b>Portugal</b>	24
	<b>Spain</b>	182
	<b>United Kingdom</b>	52
	<b>Yugoslavia (Serbia-Montenegro)</b>	17

**Note:** In the above listing, the figures for Bosnia-Herzegovina, Croatia, and Yugoslavia (Serbia-Montenegro) include holdings by various forces in the countries.

<u>Middle East</u>	<b>Iran</b>	12
	<b>Iraq</b>	118
	<b>Kuwait</b>	6
	<b>Saudi Arabia</b>	24
	<b>United Arab Emirates</b>	18
	<b>Yemen</b>	4

**Note:** Kuwait's artillery park held several dozen Model 56 pieces. Almost all of these were absorbed by Iraq in 1990, but promised for return. As of late 2002, they had not been returned.

<u>North America</u>	<b>Canada</b>	22
	<b>El Salvador</b>	14
	<b>Guatemala</b>	56
	<b>Mexico</b>	24
<u>South America</u>	<b>Argentina</b>	84
	<b>Brazil</b>	100
	<b>Chile</b>	36
	<b>Ecuador</b>	24
	<b>Peru</b>	20
	<b>Venezuela</b>	58

In addition, international arms merchants are holding around 171 Model 56 pieces.

## Forecast Rationale

Again, our latest review of the 105/14 Model 56 program finds that nothing of note having come to pass in the past year. The production of this piece is still dormant, but the marketing effort continues although it certainly is not very robust. Over the past four decades, Oto Melara has had a good deal of success with its Model 56, and the piece is so well known around the world it needs little promotion. In effect, its availability is known and if anyone is interested in this somewhat unique artillery system, it is there for sale if needed. In

point of fact, the Model 56 has long been the only new production pack artillery system firing Western pattern ammunition available in the world.

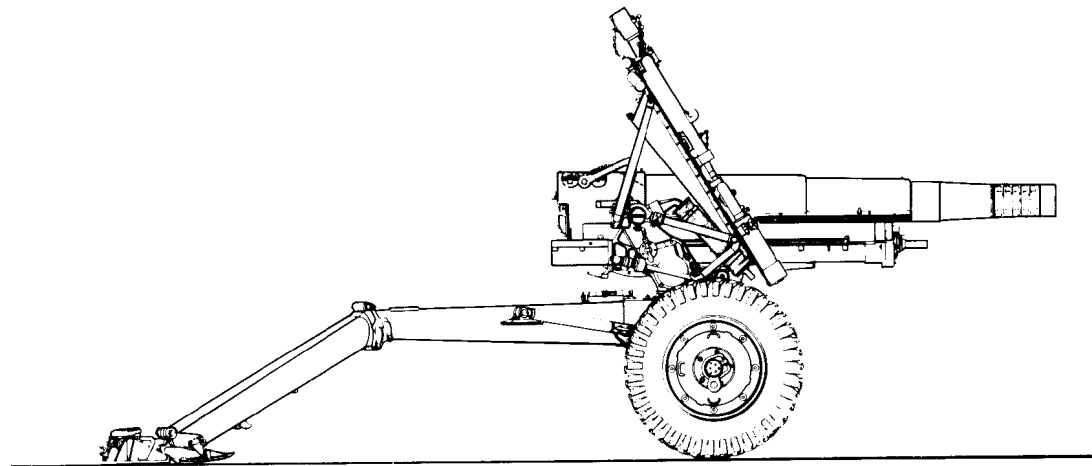
The forecast production of the Model 56 reflects the heightened interest in rapidly deployable forces and weapons that are optimized for ease of transport and use in the harshest terrain. This new interest should be sufficient to capture at least two moderate orders through the 10-year forecast period.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Ordnance	(Engine)	through 02	High Confidence Level			Good Confidence Level			Speculative			Total 03-12	
			03	04	05	06	07	08	09	10	11		12
OTO MELARA SPA													
105/14 MODEL 56 (a)	NO ENGINE	2586	0	0	3	5	1	0	0	2	4	2	17
Total Production		2586	0	0	3	5	1	0	0	2	4	2	17

(a) The through 2002 production figure is for service deliveries only.



105/14 MODEL 56 PACK HOWITZER

Source: Oto Melara