

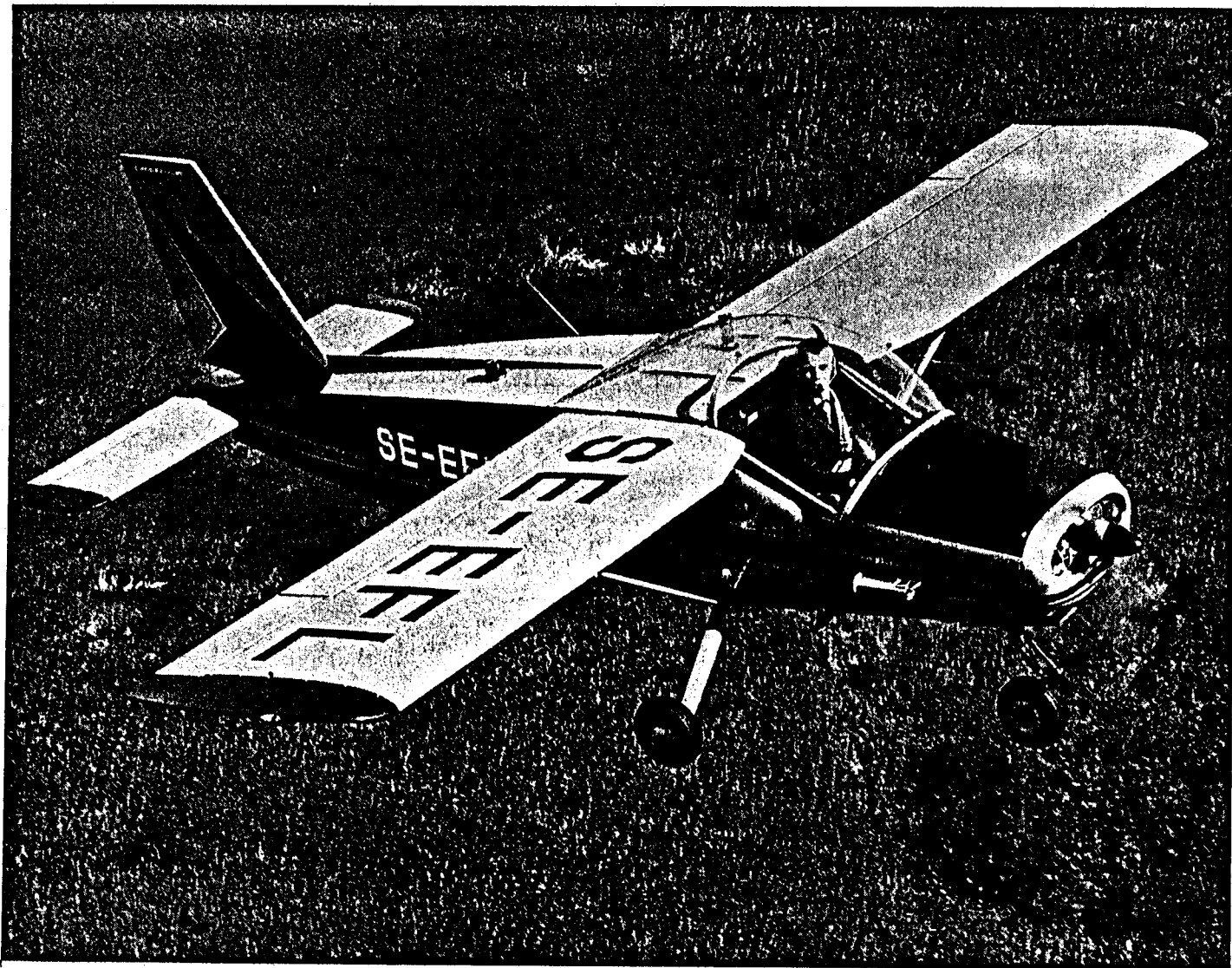
MFI-9HB



Information Package

P. O. BOX 10993
PITTSBURGH, PA 15236
Telephone: (412) 884-2798

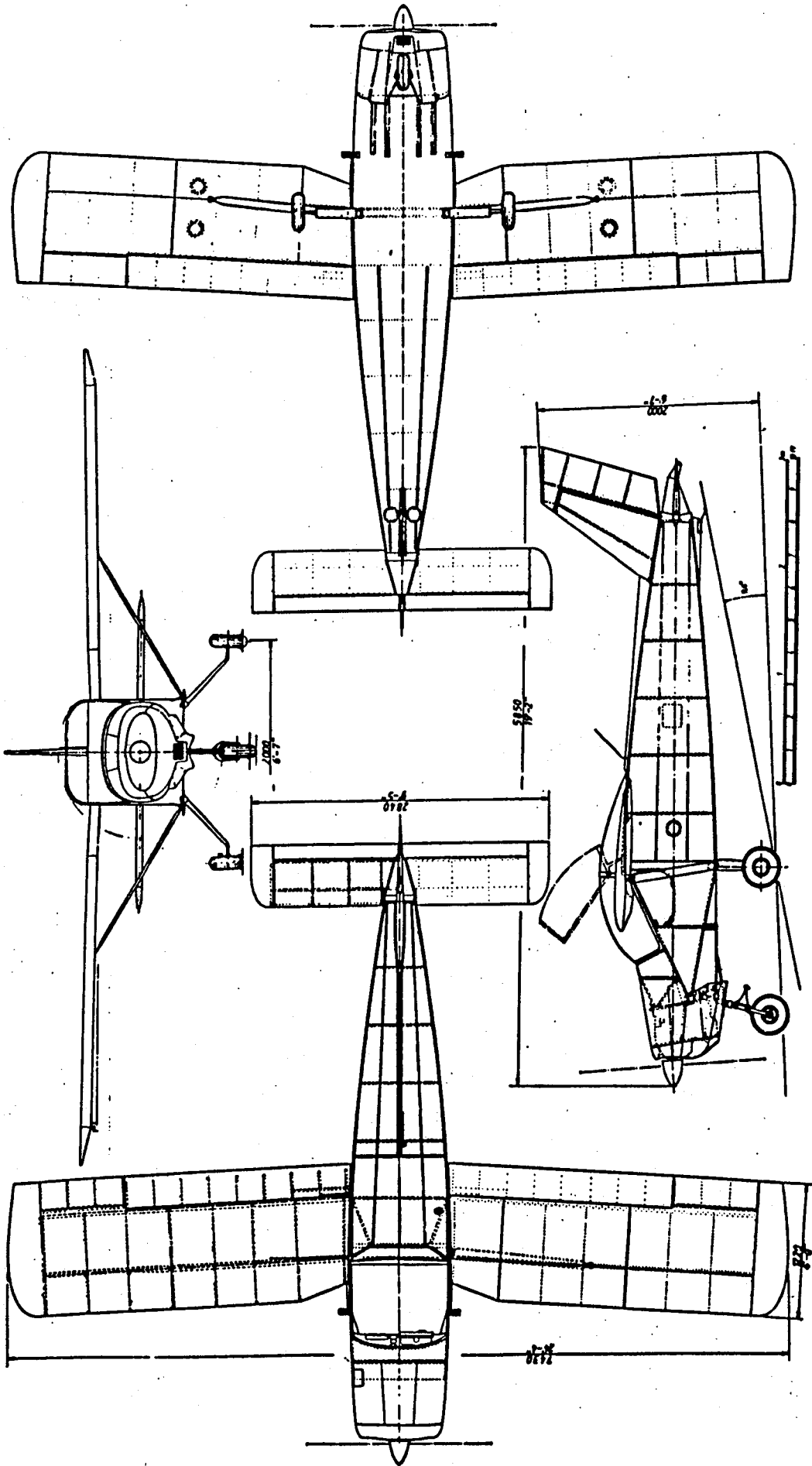
 **AMSIN AVIATION**



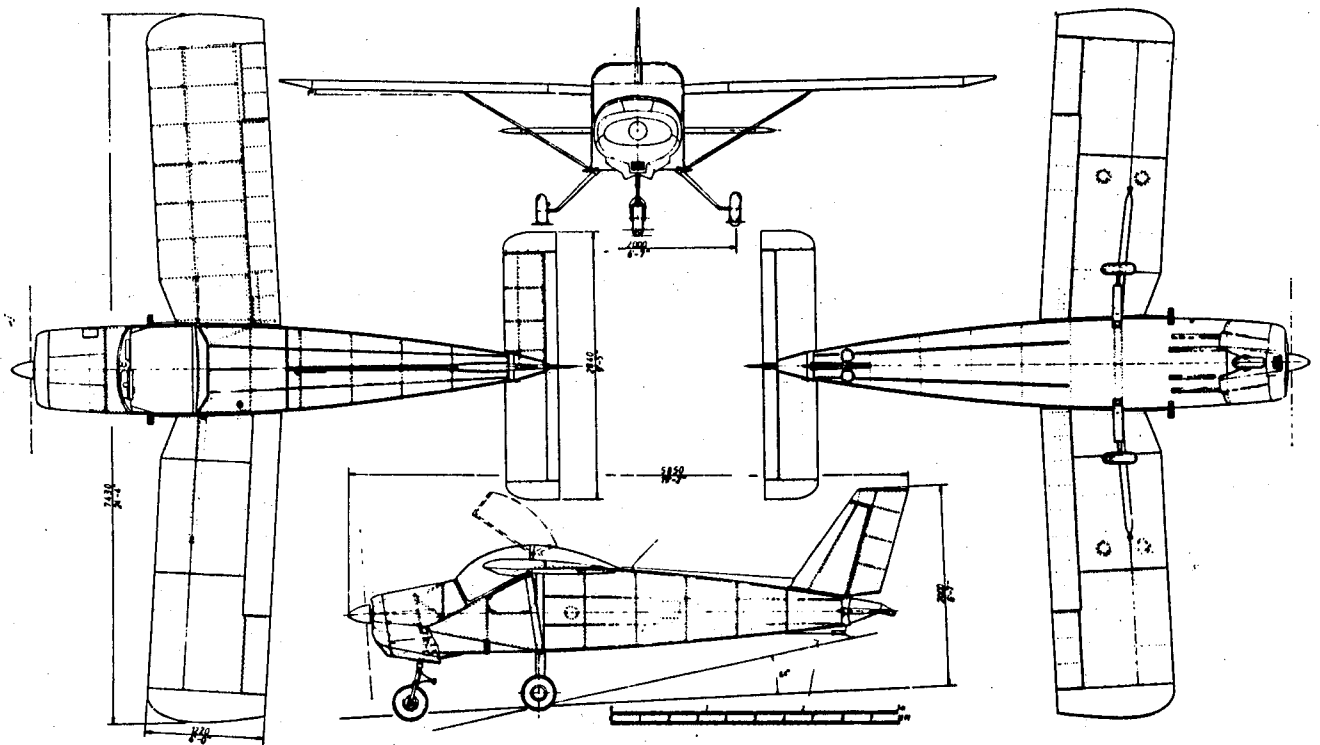
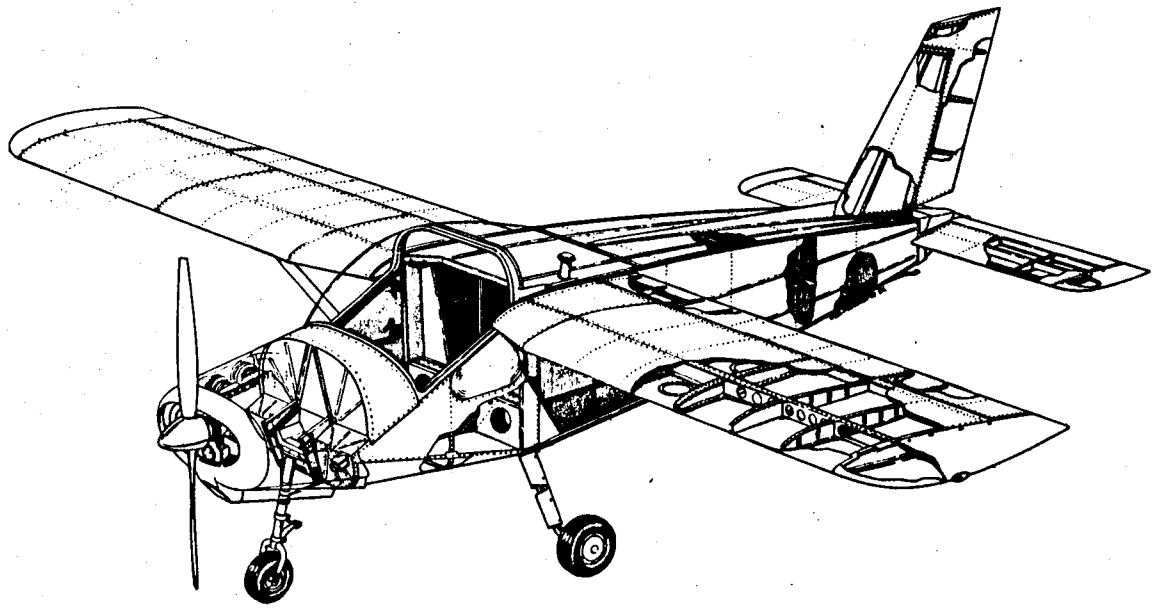
MFI - 9HB

The only all - metal, two place plane for the homebuilder with features not found in others.

- * WAS FULLY CERTIFIED AS A PRODUCTION PLANE AND PRODUCED IN SERIES BY MFI (SWEDEN) AND BOLKOW (GERMANY)
- * EXCELLENT SAFETY RECORD
- * AEROBATIC
- * HIGH PERFORMANCE
- * FANTASTIC VISIBILITY
- * USED AS A TRAINER



MFI-9 HB



MFI-9 HB

The two-seat **MFI-9HB** is an **all metal, high performance**, shoulder-winged monoplane with excellent safety record.

It is fully certified according to FAR 23 in the utility class at gross weight.

The aircraft is designed for a 100 HP Rolls-Royce/Continental O-200-A four cylinder engine but other powerplants of similar weight and power can be accommodated. The aluminum fuel tank holds 21 US gal.

The tricycle landing gear employs a steerable nose gear. **The main gear consists of maintenance-free tapered steel rods.** The **MFI-9 HB is also certified for skis and floats.** The wings are strut braced. The mass-balanced ailerons are hinged to the top surface. The plain flaps are electrically operated.

The cantilevered tail unit consists of a swept fin and rudder and an one-piece massbalanced horizontal elevator with a large anti-servo and trim tab.

The cockpit accommodates two heavy weights. Dual controls are standard. **The visibility is considered the best in the industry.** The heating and defrosting system is very efficient.

TECHNICAL DESCRIPTION

The two-seat MFI-9HB is an all-metal, high performance, shoulder-winged monoplane with an excellent safety record.

As a production aircraft, it was fully certified according to FAR pt.23 in the utility class at gross weight.

The aircraft is designed for 100 HP Continental O-200A four cylinder engine but other powerplant of similar weight and power can be accomodated. The aluminum fuel tank holds 21 US gallons.

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The cockpit accomodates two heavy weights. Dual controls are standard. The visibility is considered the best in the industry. The heating and defrosting system is very efficient.

Flying qualities are excellent and make normal aerobatic training feasible.

In spite of its good over-all performance the MFI-9HB is very simple to build. The MFI-9HB builder has the option to build either kits or source for his own materials. Non-kit builders will have to have tempory access to a good shear and bending machine (or brake press). Some of the jobs requiring this heavy equipment can of course be "farmed out" to suitable shops.

The 95 professionally made drawings are supplemented by separate material list with position nos., no. required per aircraft, material, next assembly etc. All materials, standard parts and equipment is U.S. Standard.

MAIN DATA

Length:	5.85 m	(19'2")
Height:	2.00 m	(6'7")
Wing Span:	7.43 m	(24'4")
Tail-plane Span:	2.84 m	(9'5")
Wheel Track:	2.00 m	(6'7")
Wing Area:	8.7 m ²	(93 sq.ft)
Sweep Forward:	3°	
Dihedral:	1°	
Incidence	2°	
Profile Thickness	9%	

Additional performance figures are:

MANEUVER

RECOMMENDED ENTRY SPEED

Chandelles	125 MPH
Lazy Eights	125 MPH
Steep Turns	125 MPH
Spins	Slow Deceleration
Stalls	Slow Deceleration
Loops	150 MPH
Roll	127 MPH

Maximum flap extension speed is 92 MPH.

Wing flaps		Down 35°
Aileron	Up 25°	Down 12°
Elevator	Up 16°	Down 9°
Rudder	Right 20°	Left 20°
Elevator tab	Up 22°	Down 14°

The MFI-9HB is an airplane that has come full circle. It started as a homebuilt, the BA-7, progressed to the production MFI-9 and BO-208, and is now back as a homebuilt. The MFI-9HB is the kit version of the Swedish production MFI-9 "B" model, also known as the Mili-Trainer. It is one of the very few production aircraft ever offered in kit form.

The MFI-9 and its predecessor the BA-7 were designed by Bjorn "Andy" Andreasson (EAA 1334). "Andy", a native of Sweden, built the BA-7 in his garage in San Diego, while employed as an engineer at Convair. The BA-7 first flew in October 1958. Powered by a 75 HP Continental, its figures were:

Wingspan.....	23 ft.
Length.....	18 ft.
Wing area.....	92 sq. ft.
Empty weight.....	584 lbs.
Gross weight.....	1100 lbs.
Maximum speed.....	150 mph

Andy returned to Sweden in 1960 and interested Malo Flygindustri in the production rights for the BA-7. It was renamed the MFI-9 and production commenced on the "A" series model in 1961. A production agreement was also reached with the West German aircraft firm of Bolkow-Entwicklungen KG, Munich. Bolkow produced the airplane as the BO 208. Malmo refined the MFI-9A into the "B" model while attempting to interest the Swedish government in it as a military trainer. Among the improvements were an enlarged cockpit, seats moved aft, electrically operated flaps, and enlarged vertical tail surfaces.

It was the development of the military version that prompted the Swedish nobleman Count Carl Gustave von Rosen, in 1969, to use five MFI-9B's against the Nigerian air forces during the Biafran civil war. The five MFI-9's were equipped with rocket pods under each wing. The pods were capable of loading six French 76 millimeter rockets. The following use of these MFI-9's is dramatically told in the "Soldiers Of Fortune" volume of the "The Epic Of Flight" series by Time-Life Books.

One MFI-9C model was produced. The major difference between the "B" and "C" model was the installation of a Continental/Rolls Royce O-245 (130 hp) engine in the "C".

The MFI-9 is certified in Europe for skis, floats, and glider towing.

No machining, welding, or complicated forming is required in constructing the MFI-9HB airframe. Various flat fuselage and wing skins are cut to final shape with a pair of snips.

The fuselage is extremely simple. The firewall is made up of preformed stainless steel sections. All main and aft bulkhead parts are preformed and cut to size. The aft part of the fuselage consists of four external longerons and flat skins. Production MFI-9's had external beads formed in these skins to dampen excessive vibration. Kits will use strips of sound deadening tape to achieve the same result. This eliminates expensive tooling and the builder does not have to contend with the beads when designing a paint scheme. The curved bottom cockpit skin is supplied completely preformed.

Two noticeable features of the wing are its forward sweep and "droop snoot" leading edge. The three degree forward sweep affords excellent visibility from the cockpit while keeping the center of gravity within permissible limits. The "droop snoot" leading edge has the effect of providing a more forward center of pressure at higher angles of attack, thus offsetting the strong pendulum action of the center of gravity. The main wing spar is an extruded aluminum I-beam (4" web and 2" flange). All necessary cutting and forming of the spar has been done by the factory. Only eight ribs (supplied preformed in the kit) are used in each wing. Airfoil is an NACA 23008.5 section modified at the leading edge. Wing thickness is 8%.

Getting into the MFI-9HB is not much of a problem. Dual throttles are located on the extreme right and left side of the instrument panel, and are connected by a transverse torque tube behind the panel. Friction on the throttle is adjusted by a small knob on the center of the panel. Cleveland hydraulic brakes are actuated simultaneously by a lever mounted on the left side of the lower instrument console. A simple ratchet lock disengages easily by pulling the handle to one side. The MFI-9HB will turn 360 degrees in its own length. The anti-servo trim tab mechanism consists of a cockpit lever which moves a sheathed, steel rod connected to a bellcrank at the tailpost. The bellcrank, fitted with a small friction-disc brake is linked to the tab by a short rod. Flaps are electrically operated by a toggle switch located next to the left throttle. A flap position indicator is marked to show any position from 0 to 35 degrees.

During takeoff the controls are firm and well balanced. There is no tendency to swing because of the propellor slipstream acting on the rudder. The $1\frac{1}{2}$ degree offset thrustline along with the tricycle landing gear both help with this stability. With two aboard the MFI-9HB accelerates well and lifts off at about 52 knots. The elevator has a positive feel and lift off is precisely controlled, the airplane responding to the stick. Climbout can be fairly steep, but the canopy and thin-sectioned shoulder wing configuration gives unobstructed visibility. Rudder firmness is apparent. The MFI-9HB cuts through gusty air without wallowing. It can be trimmed to fly hands off by virtue of the elevator trim control and longitudinal stability. The ailerons, although small, are very effective. A 360 degree roll can be completed in less than three seconds. Loops have to be pulled around sharply in the first half to maintain enough speed over the top without stalling. Failure to do so causes the MFI-9HB to roll out by itself. At low speeds and with normal handling the airplane will not stall in the normal sense. With two aboard and full flaps it can be slowed to about 51 knots indicated without loss of altitude. Elevator effectiveness and wing-lift give out together. Full aileron remains so that there is a steep decent with strong buffeting and the nose just below the horizon, with the ability to waggle the wings and swing the nose to correct wing topping. Landing approaches can be fairly steep, the flaps going up or down rapidly. A precise, smooth flair is effortless because the stick loading becomes heavier in direct proportion to the decaying airspeed. Letting the airplane fly two feet off the ground, it lands itself. Even at the recommended approach speed of 70 knots, the landing roll is not long.

Main data

Length	5.85 m	(19 ft 2")
Height	2.00 m	(6 ft 7")
Wing span	7.43 m	(24 ft 4")
Tail-plane span	2.84 m	(9 ft 5")
Wheel track	2.00 m	(6 ft 7")
Wing area	8.7 m ²	(93 sq. ft)
Sweep forward	3°	
Dihedral	1°	
Incidence	2°	
Profile thickness	9%	

Weight and balance

Empty weight	340 kg	(750 lb)
Payload	235 kg	(518 lb)
Grossweight	575 kg	(1268 lb)

No special loading instruction is required for the MFI-9 HB if the gross weight is not exceeded, if the baggage does not exceed 20 kg (44 lb) and if the total weight for the two pilots does not exceed 180 kg (397 lb).

Performance (at max T. O. weight)

Max level speed at S/L	240 km/h	(149 mph)
Design diving speed	305 km/h	(190 mph)
Max cruising speed	236 km/h	(145 mph)
Econ. cruising speed at S/L	210 km/h	(130 mph)
Stalling speed, power off	80 km/h	(50mph)
Rate of climb	4.5 m/s	(900 ft/min)
Service ceiling	4500 m	(15000 ft)
T-O run, grass	150 m	(490 ft)
Landing run	130 m	(425 ft)
Range with max payload	800 km	(500 miles)
Endurance at 70% power	4 hours	

**PROFESSIONALLY MADE ENGINEERING
DRAWINGS AVAILABLE FROM:**

Bjorn Andreasson
Collins vag 22B
S-236 00 HOLLVIKSNAS
SWEDEN

Cost: \$150.00 plus \$20.00
shipping.

**MANUFACTURER: CANA AIRCRAFT
COMPANY**

211 Holland Avenue # 02-21, Singapore 1027
Tel: 669967, 673837.
Telex: 33872 CANA
Cable Add: CANAYONG

PERFORMANCE COMPARISON

	BEECHCRAFT SKIPPER	CESSNA 150	PIPER TOMAHAWK	MFI-9HB
Length	24'1½"	24'1"	23'2"	19'2"
Height	6'11"	8'6"	9'1"	6'7"
Wing Span	30'0"	32'8½"	34'0"	24'4"
Tail-Plane Span	9'10"	10'0"	10'6"	9'5"
Wheel Track	8'3½"	7'7½"	10'0"	6'7"
Wing Area	129.8 sq ft	157 sq ft	124.7 sq ft	93 sq ft
Sweep Forward				3°
Dihedral	6°	1°	5°	1°
Incidence				2°
Profile Thickness				9%
Empty Weight	1103 lbs	1107 lbs	1128 lbs	750 lbs
Payload	572 lbs	563 lbs	542 lbs	513 lbs
Gross Weight	1675 lbs	1670 lbs	1670 lbs	1268 lbs
Max. Speed @ S/L	122 mph, 106 kn	127 mph, 110 kn	126 mph, 109 kn	143 mph, 130 kn
Design Diving Speed				190 mph
Max. Cruising Speed	121 mph, 105 kn	123 mph, 107 kn	124 mph, 108 kn	145 mph, 127 kn
Econ. Cruising Speed @ S/L	101 mph, 88 kn			130 mph, 113 kn
Stalling Speed	45 mph, 39 kn	50 mph, 43 kn	56.5 mph, 49 kn	50 mph, 43 kn
Rate of Climb	720 ft/min	715 ft/min	725 ft/min	900 ft/min
Service Ceiling	12900 ft	14700 ft	13000 ft	15000 ft
T-O Run	780 ft	725 ft	805 ft	490 ft
Landing Run	670 ft	475 ft	707 ft	425 ft
Range	475 miles			500 miles
Endurance				4 hrs @ 70 % power
Powerplant	Lyc 115 hp	Lyc 110 hp	Lyc 112 hp	Cont. 100 hp

THE FIRST "MILI-TRAINER" (BELOW) IS CHROME YELLOW ALL OVER. SPINNER, MISSILE-RACKS, AND TIPS OF WINGS & TAIL PLANE: RED. BLACK ANTI-GLARE AND LETTERING.

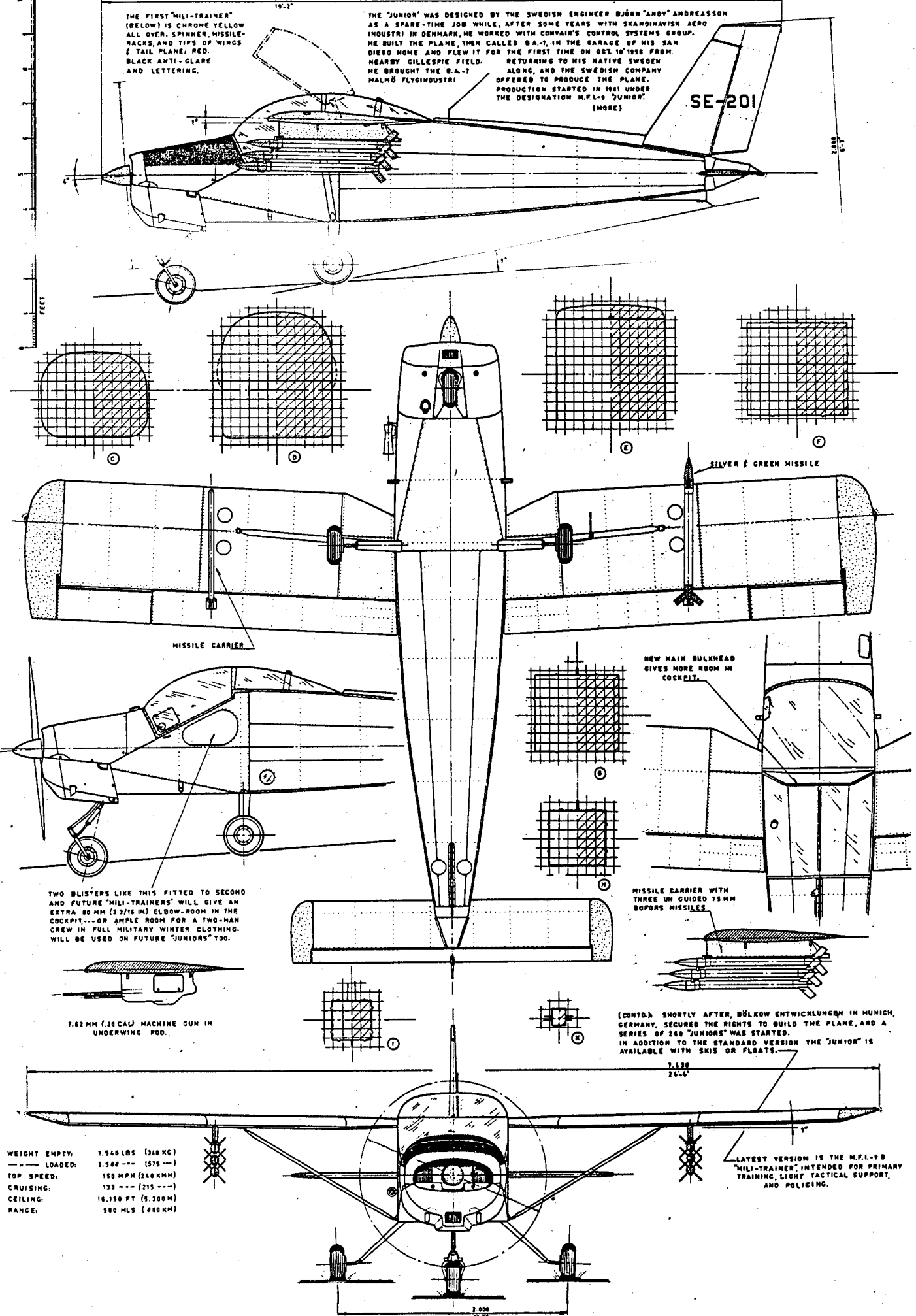
THE "JUNIOR" WAS DESIGNED BY THE SWEDISH ENGINEER BJÖRN "ANDY" ANDREASSON AS A SPARE-TIME JOB WHILE, AFTER SOME YEARS WITH SKANDINAVISK AERO INDUSTRI IN DENMARK, HE WORKED WITH CONVAIR'S CONTROL SYSTEMS GROUP. HE BUILT THE PLANE, THEN CALLED BA-7, IN THE GARAGE OF HIS SAN DIEGO HOME AND FLEW IT FOR THE FIRST TIME ON OCT. 18, 1956 FROM NEARBY GILLESPIE FIELD. HE BROUGHT THE BA-7 MALMÖ FLYGINDUSTRI RETURNING TO HIS NATIVE SWEDEN ALONG, AND THE SWEDISH COMPANY OFFERED TO PRODUCE THE PLANE. PRODUCTION STARTED IN 1961 UNDER THE DESIGNATION M.F.L.9 "JUNIOR" (MORE)

SE-201

5.850
19'-2"

14'-0"

FEET



TWO BLISTERS LIKE THIS FITTED TO SECOND AND FUTURE "MILI-TRAINERS" WILL GIVE AN EXTRA 80 MM (3 1/16 IN.) ELBOW-ROOM IN THE COCKPIT... OR AMPLE ROOM FOR A TWO-MAN CREW IN FULL MILITARY WINTER CLOTHING. WILL BE USED ON FUTURE "JUNIORS" TOO.

7.62 MM (.30 CAL) MACHINE GUN IN UNDERWING POD.

NEW MAIN BULKHEAD GIVES MORE ROOM IN COCKPIT.

MISSILE CARRIER WITH THREE UN GUIDED 75MM BOPORS MISSILES

(CONT'D) SHORTLY AFTER, BÜLKOW ENTWICKLUNGEN IN MUNICH, GERMANY, SECURED THE RIGHTS TO BUILD THE PLANE, AND A SERIES OF 260 "JUNIORS" WAS STARTED. IN ADDITION TO THE STANDARD VERSION THE "JUNIOR" IS AVAILABLE WITH SKIS OR FLOATS.

7.530
24'-6"

WEIGHT EMPTY: 1,540 LBS (340 KG)
 --- LOADED: 2,500 --- (575 ---)
 TOP SPEED: 150 MPH (240 KM/H)
 CRUISING: 133 --- (215 ---)
 CEILING: 16,150 FT (5,300 M)
 RANGE: 500 MLS (400 KM)

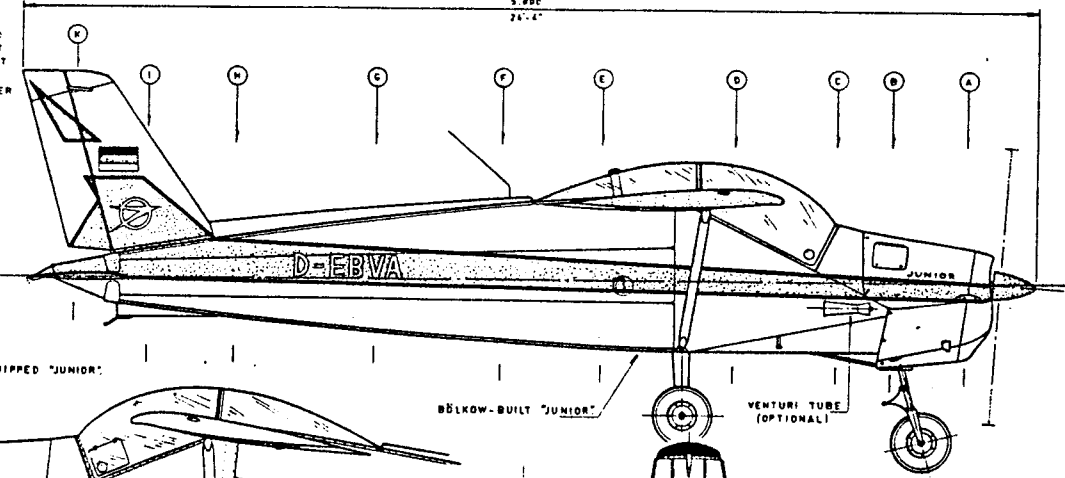
LATEST VERSION IS THE M.F.L.9-B "MILI-TRAINER", INTENDED FOR PRIMARY TRAINING, LIGHT TACTICAL SUPPORT, AND POLICING.

2.000
6'-3"

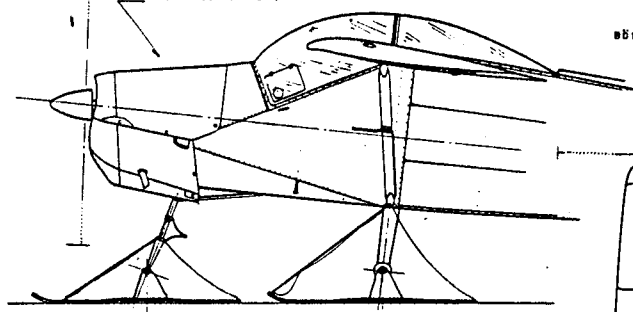
THE "JUNIOR" IS PAINTED WHITE WITH RED, LIGHT BLUE, YELLOW, OR LIGHT GREEN TRIM WITH A NARROW BLACK BORDER LINE. (BLUE TRIM HAS RED BORDER LINE). PROPELLER IS SILVER WITH MATT BLACK BACK AND YELLOW TIPS.

5.800
21'-4"

1.5
0.5
METRES

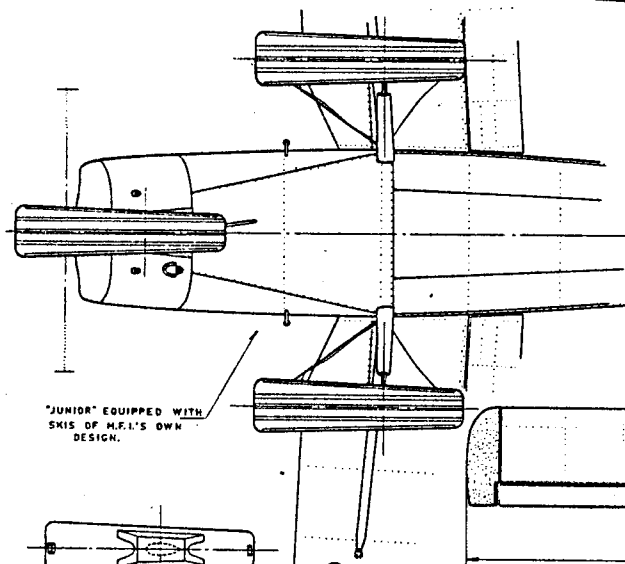
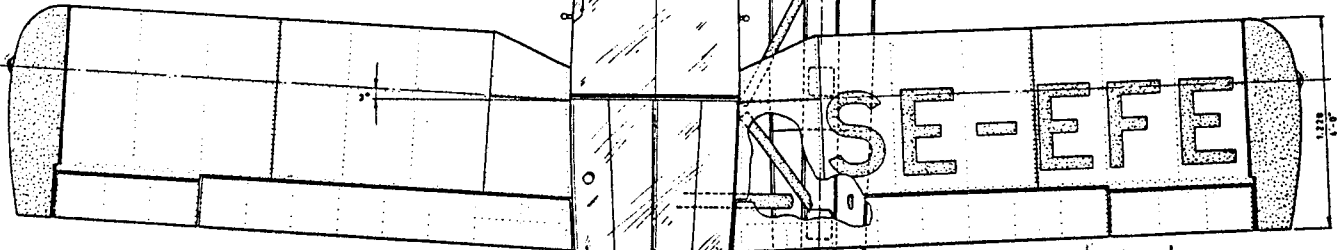
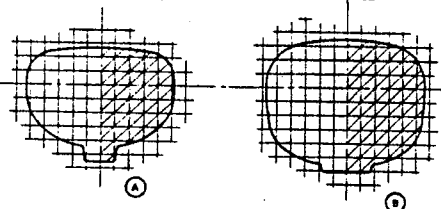
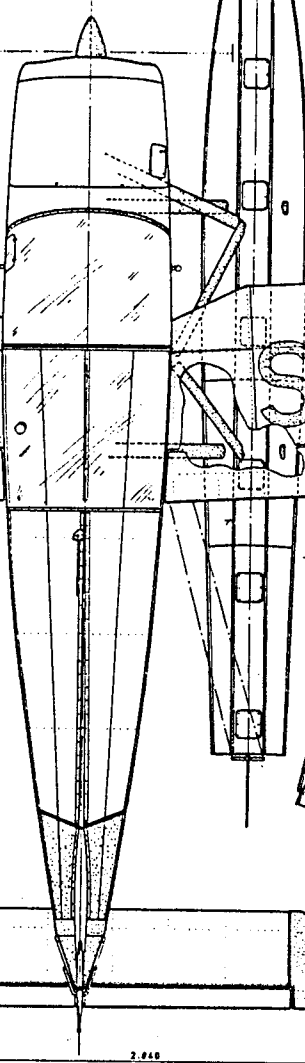


SKI-EQUIPPED "JUNIOR"

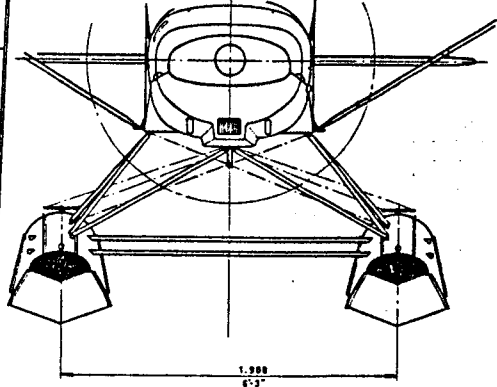


BULK-BUILT "JUNIOR"

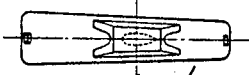
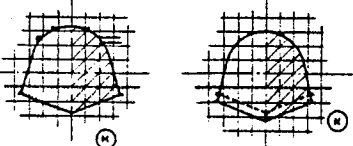
VENTURI TUBE (OPTIONAL)



"JUNIOR" EQUIPPED WITH SKIS OF M.F.I.'S OWN DESIGN.

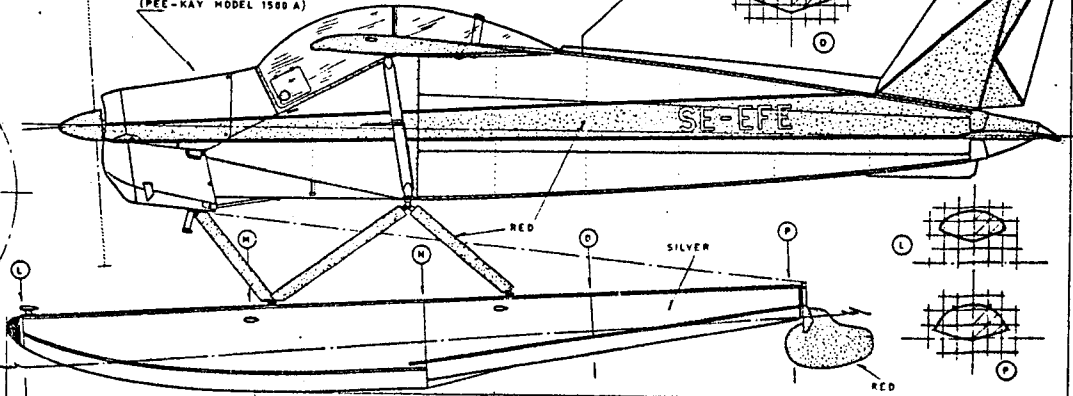


1.900
6'-3"



TOP VIEW OF SKI.

M.F.I. "JUNIOR" WITH FLOATS. (PEE-KAY MODEL 1500 A)

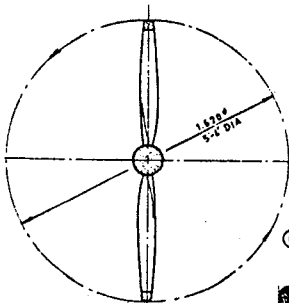


2.800
9'-4"

RED

SILVER

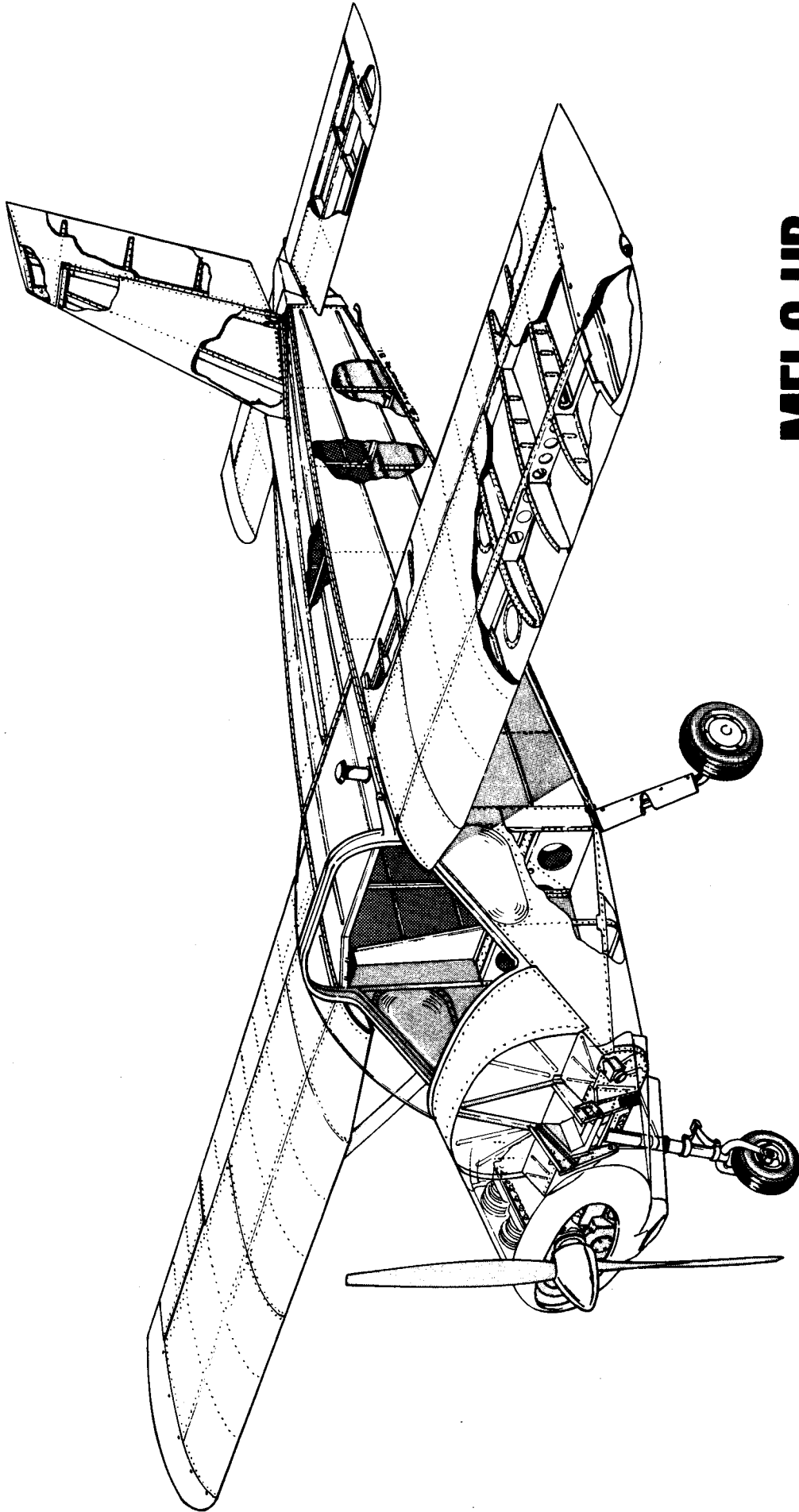
RED



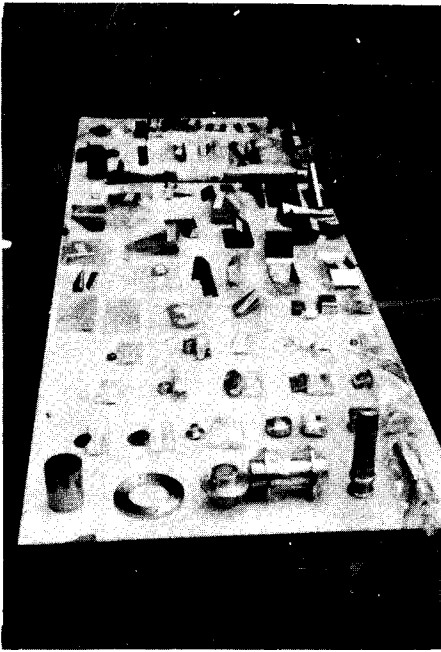
TWO-BLADE McCAULEY PROPELLER.

6.050

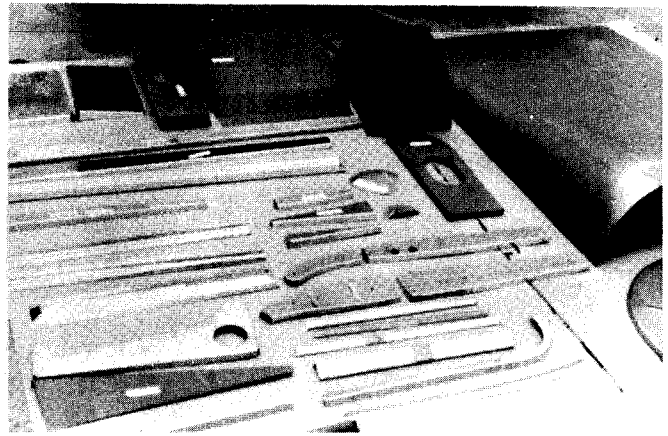
3'-7 1/2"



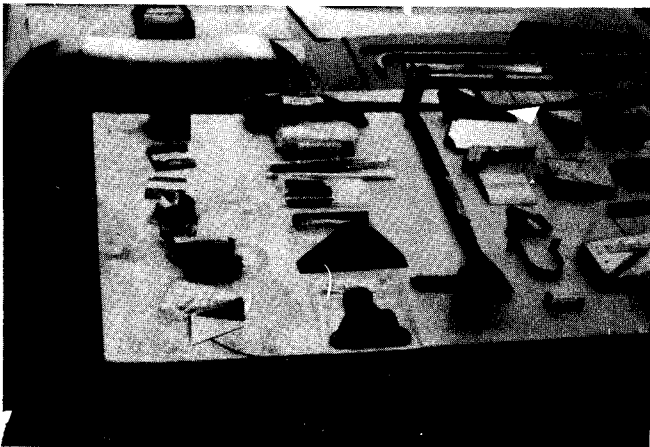
MFI-9 HB



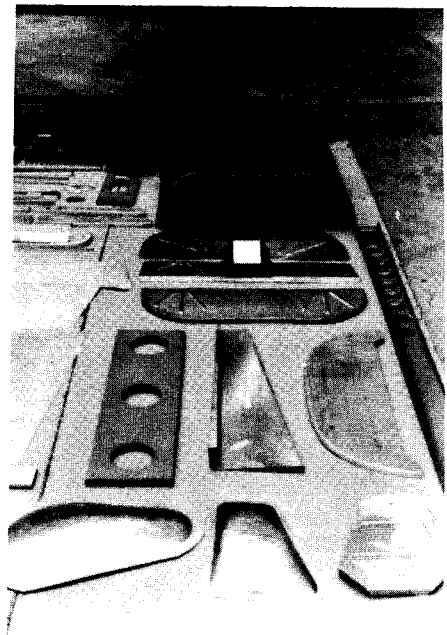
[1] A portion of the many machined parts and fittings.



[2] Shown, top to bottom, are:
Battery box, seat, inner wing leading edge skin, rudder and elevator spars, wing ribs.



[4] Another view of the machined parts. The cast elevator fitting is shown at bottom row center.



[3] Shown, top to bottom, are:
Cockpit bottom skin, firewall pieces, wing spar, main bulkhead parts, instrument panel, cockpit blister, fuel tank side.

NOTES FOR THE MFI-9HB BULIDER

- 1. In order to greatly facilitate your new project, we strongly recommend as a first and most important step, joining the Experimental Aircraft Association, P.O. Box 229, Hales Corner, WI 53130. U.S.A. This non-profit organization has become the world authority of the Homebuilder's movement, and a superb publication, Sport Aviation, is sent to its members monthly. Nearly 400 Chapters in most big cities and in foreign countries constitute a gigantic network for exchanging knowledge, information and camaraderie. The E.A.A. publishes many manuals and booklets, covering every facet of amateur aircraft construction.**
- 2. Obtain a set of MFI-9HB blueprints.**
- 3. Submit your name for the newsletter.**
- 4. Do not at anytime compromise in the standard of your workmanship, if any particular part is badly done, please scrap the part, we are more than willing to help you with any replacement part that you would require.**

REFERENCE: Q.C. SHEET

In order to maintain records on the quality of our parts, we include in every Group Kit a Q.C. sheet which is printed in triplicate.

We insist the builder complete the bottom portion of the Q.C. sheet and forward two copies to us.

A brief explanation of the sample Q.C. sheet.

Part No: e.g. 9.10.166-001
Description: Gusset
Material: 2024-T3
Batch No: MFI-9HB, No.1

Dimensions: Pass
Deburring: Yes
Pilot holes: No
Alodine: Yes
Priming: Yes
Checked by: XYZ

Name: Name of purchaser e.g. "Tom Smith"
Address: rerererttt yuuuyuyu U.S.A.

Date kit received: 6th June 1984
Comments: To be filled in by purchaser.

Please note that not all parts will have a Q.C. sheet, there are just too many parts, only critical parts will have them, even so, every part is checked at the factory before it is shipped to the customer.

Q.C. SHEET (INCLUDED IN EVERY KIT)

Part No: _____

Description: _____

Material _____

Batch No: _____

Dimensions: _____

Deburring: _____

Pilot Holes: _____

Alodine: _____

Priming: _____

Checked by _____

Name _____

Address: _____

Date kit received: _____

Comments: _____

PURCHASE AGREEMENT : MFI-9HB KITS

CANA AIRCRAFT CO. PTE. LTD., manufacturer of the MFI-9HB, a kit type sport plane intended for homebuilt construction, herein referred to as CANA. The MFI-9HB requires inspection and certification for use by the Federal Aviation Administration, herein referred to as the FAA under the provisions of the Federal Aviation Regulations, herein referred to as FAR's. The undersigned individual, herein referred to as the Purchaser, intends to built one or more MFI-9HB aircraft from kits purchased from CANA and he understands and agrees to the following conditions and requirements.

AIRCRAFT CERTIFICATION

The Purchaser has read, investigated, and thoroughly understands FAR's as they apply to the certification of homebuilt aircraft in the Experimental Category. The Purchaser understands the homebuilt aircraft maybe certificated as, Experimental-Amateur or Experimental-Exhibition, depending on various conditions. The Purchaser has investigated and is thoroughly familiar with the certification requirements and the aircraft operating limitations imposed by the FAA for these certification categories. The Purchaser has investigated and is aware that many factors beyond the control CANA affects the certification of the MFI-9HB, including the final as constructed quality and resultant airworthiness, which is directly exclusively the result of the actions of the purchaser, and varying interpretation by the FAA of the FAR's for certification of the homebuilt aircraft under Experimental-Amateur or Experimental-Exhibition categories.

The Purchaser understands that CANA does not represent any MFI-9HB aircraft constructed by him from kits purchased from CANA will qualify for certification in any particular category by the FAA, and that CANA accepts no responsibility whatsoever for such certification. The Purchaser accepts sole responsibility for the certification of any MFI-9HB aircraft constructed by him from kits purchased from CANA.

AIRCRAFT DESIGN INTEGRITY

The MFI-9HB holds a type certificate and was produced in series, however any individual MFI-9HB as constructed by the Purchaser will vary in performance and handling unless the Purchaser adheres to the original design. CANA accepts no responsibility when any modification to the MFI-9HB is carried out. The Purchaser accepts and acknowledge sole responsibility, should he carry out any changes to the MFI-9HB.

ACCIDENT LIABILITY

The Purchaser understands and agrees that many factors beyond the control of CANA affect the operational safety of any aircraft constructed by him from kits purchased from CANA, including the performance by the Purchaser or others of inspections, maintenance procedures, and the repairs on the finished aircraft, and the operation of the aircraft by the Purchaser or others while on the ground or in flight. The Purchaser accepts full responsibility of the construction and operation of the MFI-9HB aircraft constructed by him from kits purchased from CANA. The Purchaser releases CANA from any liability or bodily injuries or property damage arising from his construction, maintenance or operation of any aircraft.

PURCHASE AGREEMENT: MFI-9HB BLUEPRINTS

I, the undersigned hereby acknowledges that I have requested instruction, materials and information for the construction of one **MFI-9HB** from BJORN ANDREASSON, designer of the **MFI-9HB**, with the intention of building and flying for sport and personal pleasure. I acknowledge that the sport of flying involves certain inherent risk of personal injury, damage to property. I release BJORN ANDREASSON from any liabilities arising from the construction or operation of the **MFI-9HB** which I, or my heirs, or personal representatives might suffer during the construction or operation of the aircraft.

I acknowledge that I will not hold BJORN ANDREASSON responsible for any changes or materials substitution I make of the **MFI-9HB** design or construction methods.

I acknowledge that BJORN ANDREASSON has made no representation or promise that I will be successful in building or flying the aircraft.

IN WITNESS WHEREOF I have executed this agreement on this _____ day of _____ 198 .

Name: _____

Address: _____

City: _____

State: _____

Zip Code: _____

Telephone: _____

Signature _____ Date: _____