# WARNING

## YOU HAVE JUST WASTED A LOT OF MONEY UNLESS YOU FIRST FOLLOW THESE INSTRUCTIONS.

## CLAIMS FOR DAMAGED OR MISSING PARTS

1. Completely inventory the kit using the supplied packing list. Do not remove any parts from the blister-packed boards until you have finished counting everything. The exception is parts such as nuts, washers and pop rivets which you may have to remove for accurate counting.

2. If you believe you are missing any parts or have damaged parts, inspect the boxes for holes or damage. Actually, you should have inspected the boxes prior to opening. For lost or damaged parts, you must file a claim with the freight carrier.

3. Your kit was double quality control inspected in our factory to ensure the accuracy of its contents. However, if you believe some parts were omitted at our factory, you need to do the following:
   a. Itemize the part number, quantity and description of each part.
   b. Note the aircraft model, serial number and date received.
   c. Report the claim to your dealer. All claims must be processed through your dealer. Upon receipt of claim, we will compare it to our original packaging records.

4. Only one claim per kit will be reviewed. "**DO NOT**" begin assembly until you have completed your inventory. The packing list is the most accurate representation of the parts required. Making a list during assembly will not work and will not be accepted. People have been known to use the wrong size bolt as compared to what is called for by the assembly instructions. This leads you to think parts are missing. Also, bits and pieces tend to roll under countertops, are borrowed, or inadvertently disappear. You best protection to build a complete airplane is to make sure you have all the parts before you start.

**YOU HAVE 30 DAYS FROM RECEIPT OF KIT TO FILE A CLAIM.**

**If you do not adhere to the above procedures, the company reserves the right to dismiss any claim. Replacement parts would then be treated as a normal spare parts order.**

**We hope you enjoy building your kit, and thank you for your patronage. If you have any questions, please contact your dealer. If they are unable to answer your questions, the dealer can contact our customer service department for assistance.**

## INTRODUCTION

This manual is designed to provide the GT pilot and/or owner with Aircraft descriptions, data, Assembly Instructions, maintenance procedures, maintenance schedules, service, handling and Airworthiness Limitations in order to operate and maintain the GT in reasonable and proper manner.

Section 1 is the GT 400 Basic Aircraft Information and Data.

Sections 2-7 are the Initial Assembly Instructions, and Basic Maintenance and Service Disassembly and Reassembly instructions. These sections also are to be used for Replacement Part idenification and specific part descriptions.

Section 8 is the Basic Maintenance Instructions with maintenance schedules. It also Includes information on Aircraft Handling and Service.

Section 9 is the Airworthiness Limitations.

**********IMPORTANT NOTICE**********

The Preceding page is the revision form to record all revisions and admendments. Upon receiving revisions and admendments remove obselete pages and insert new pages where applicable.

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# AIRCRAFT INFORMATION AND DATA

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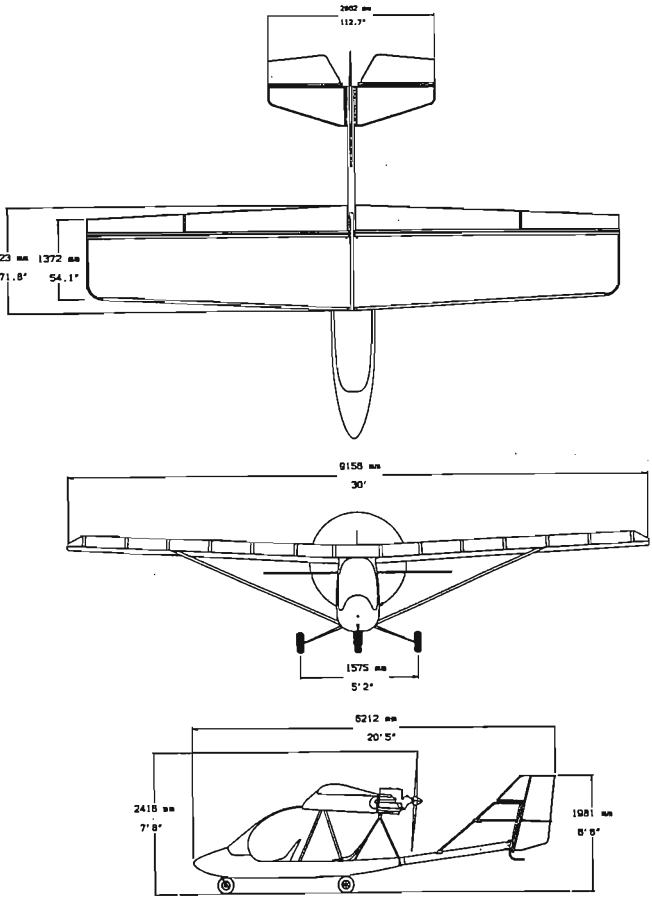



Figure 1-2: 8trut Braced GT - Three View

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## INTRODUCTION

This manual is divided into 9 sections. It contains all information and data as required by the Professional Ultralight Manufactures Association (PUMA) as approved by the Federal Aviation Administration (FAA) and/or other agencies. Quicksilver Enterprises Inc., has included additional information that will assist you in the operarion of the Quicksilver GT. For safety, a thorough understanding of this manual is essential.

## DESCRIPTIVE DATA AND SPIECIFICATIONS

| ENGINE : | GT500 |
|---|---|
| Manufacturer: | Bombardier-Rotax |
| Model: | 582/40 |
| Displacement: | 582/40 cc |
| Type: | Twin cyl. |

two-cycle, air-cooled, single magneto ignition

Spark Plug: NGK B8ES, gap- .016-.020 in. (.04-.05 cm.)
Horsepower: 65 hp @ 6500rpm
Recommended Time Before Overhaul: (TBO) 250 hrs.

**REDUCTION DRIVE SYSTEM :**

| | GT500 |
|---|---|
| Type: | Helical Gear |
| Number of Belts: | N/A |
| Belt Type: | N/A |
| Gear Oil: | SAE 85W90 (400cc) |
| Reduction Ratio: | 2.58 to 1 |

| PROPELLER: | GT500 |
|---|---|
| Type: | Fixed pitch, two blade, wooden Quicksilver Part# 30251 |
| Diameter: | 68 in. (1727 mm) |
| Pitch: | 38in (965 mm)-RH |
| Maximinum Speed: | 2800 rpm |

**AILERON TRAVEL**
- UP.....27 degrees
- DOWN.....16 degrees

**WING FLAP TRAVEL**
- UP.....0 degerees
- DOWN.....38 degrees

**RUDDER TRAVEL** (Measured Perpendicular to Hinge Line)
- RIGHT.....25 degrees
- LEFT.....25 degrees

**ELEVATOR TRAVEL**
- UP.....39 degrees
- DOWN.....25 degrees

**STABILIZER INCIDENCE**
- UP. (Top).....1 degree negative
- DOWN. (Bottom).....5 degrees negative

**FUEL**

Approved Fuel: Automobile gasoline (83 octane or higher)
Fuel Capacity: 8.5 gallons (32.2 litres
Useable Fuel: 8.25 gallons (31) litres
Unuseable Fuel: .25 gallons (.007) litres

**OIL**

Fuel Mixture
Approved Type of Oil: BIA-TC-W-2 two-cycle oil
Fuel/Oil Ratio: 50:1
Gearbox - GT500
Gear Oil: SAE 85W90 (400cc)

| **GT WEIGHTS:** | **GT500** | **(METRIC)** |
|---|---|---|
| Maximum Takeoff Weight: | 850 lbs. | (385 kilograms) |
| Maximum Landing Weight: | 850 lbs. | (385 kilograms) |
| Empty Weight: | | |
| Strut Braced: | 420 lbs * | (190 kilograms) |
| Maximum Useful Load: | | |
| Strut Braced: | 430 lbs | (194 kilograms) |

* The empty weight is shown with a pilot/vehicle recovery system. When computing weight values, the actual weight of the aircraft, as equipped, should be determined. For accurate computation, refer to WEIGHT and BALANCE (SECTION 6).

**SPECIFIC LOADINGS :**

| | GT500 | |
|---|---|---|
| Wing Loading: | 5.34 lbs/sq ft | (8.0 kg/sq m) |
| Power Loading: | 17 lbs/hp | (7.7 kg/hp) |

**TIRE PRESSURE**

Main Wheel Tires: 25 - 30 PSI * (172-206 kpa)
Nose Wheel Tire: 25 - 30 PSI * (172-206 kpa)
* Check raised lettering on tire sidewall for maximum allowable PSI (lbs/in2).
Ground Turning Clearance.....78 ft. (26.52 meters)
(Wing tip to Wing tip)

**** SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE ****

**AIRCRAFT AND SYSTEMS DESCRIPTION**
This section provides a general description and speration of the aircraft and its systems. Only equipment that is considered standard os detailed in this section.

AIRFRAME

Note:For Servicing as precribed by Legend 1 in the Maintenance Schedules for all hinged points and movable connections use General Purpose Oil Mil-l-7078-A or equivalent.

The primary construction material of the airframe is of tubular aircraft grade aluminum. Major items of struture are the forward fuselage and tail boom tubes. The flight controls, nose wheel, and seat are attached to the forward fuselage tube. The mounting structure for the root tube is attached to the aft section of the forward fuselage tube and the forward section of the tail boom tube. The main landing gear carry-thru is the jointing structure of the two boom tubes. The empennage (tail assembly) is attached to the aft section of the tail boom tube.

The externally braced wings are constructed of a front (leading edge) and rear (trailing edge) spar held in place by compression and diagonal struts. The airfoil shape is maintanined by formed tubular ribs contained in upper and lower pockets in the Dacron wing covering. The leading edge and trailing edge spars are equipped wih wing-to-root tube and wing-to-strut attachment fittings. Conventional hinged ailerons are attached to the outboard section of the trailing edge of the wings. Conventional flaps are attached to the inboard trailing edge of the wings.

The tail assembly consists of a conventional vertical stabilizer, rudder, adjustable horizontal stabilizer, and elevator. The tail assembly flight surfaces are covered with Dacron. An adjustable cockpit trim is incorporated into the horizontal stabilizer (refer to the SECTION 4 for proper adjustment procedures).

FLIGHT CONTROLS

The aircraft's flight control system consists of conventional aileron, rudder, and elevator control surfaces. The control surfaces are manually operated through mechanical linkage using the control wheel for the ailerons and elevator, and rudder pedals for the rudder. The elevator control system is equipped with a balance spring which provides improved stability in flight. There are front and rear seat controls for aileron, rudder, elevator and trim.

**Trim System**

Throughly inspect the trim system starting at the trim lever positions at the front and rear pilot seat positons. Check for free movement while observing the stabilizer moving down while pushing the lever forward, and up while pulling the lever aft. Inspect lever and pushpull connections through the 1" inspection holes on the left side of the forward fuselege tube directly behind the trim lever.

Inspect the Rear pushrods and bellcranks of the trim system at stabilizer. Un sip the vertical stabilizer cover to lower rod and bellcrank. Inspect push pull tube connection through the 1" hole in the left side of rear fuselege tube. Check to see that the horizantial stabilizer is moving the full travel of the upper trim slide plates.

## GROUND CONTROL (TAXIING)

Effective ground control while taxiing is accomplished through the rudder pedals. Nose wheel steering and the propeller wash over the rudder will cause the aircraft to turn in the desired direction (i.e.- Left rudder pedal to steer Left and Right rudder pedal to steer Right). When a rudder pedal is depressed, a steering spring (which is connected from the rudder pedal to the nose wheel) will turn the nose wheel through an arc of approximately 15 degrees each side of center.

## FLAP SYSTEM

The flaps are conventional and are extended or retracted by positioning the flap selector lever, located over the front pilot's head only, to the desired flap deflection position. The flap lever moves forward or aft under a metal plate that provides mechanical stops at the 0, 10, 20, and 30 degree positions. The flap selector lever must be pulled forward slightly, then gently down before moving it into a new position. As the lever begins to move, release the downward pressure. When the new flap position is reached, ensure that the lever is securely seated in the new position.

## LANDING GEAR SYSTEM

The landing gear is of the tricycle type with a steerable nose wheel and two main wheels. Shock absorbtion is provided by the tapered aluminum alloy main landing gear legs. The nose wheel is equipped with a friction plate brake.

## SEAT

Both seats are attached to the forward fuselage tube by the seat rails. They are adjustable fore and aft. The seat should be adjusted while standing to the right of the seat. In order to allow the seat to move, pull the seat locking pin located under the right side of the seat and move the seat to the desired position. Ensure that the locking pin locks into the seat rail. Ensure that the seat will not move either forward or aft by exerting pressure in both directions.

The aircraft is equipped with a pilot restraint system. At any time the pilot is seated in the aircraft with the intent of moving it, the pilot restaint system must be securely fastened. The rear seat restraint system must be secured even when not in use.

## ENGINE

The GT 500 is powered by a twin cylinder, water cooled two-cycle Otto engine. The engine is a Rotax 582/40 - 580.7 cc Displacement, rated at 65 horsepower at 6500 RPM. Major components include Helical Gear reduction drive system, exhaust system, and a mechanical rewind manual starter.

## THROTTLE CONTROL

The throttle is a cable controlled system with the throttle control lever located to the right side of both pilot's seats. Moving the lever forward increases RPM; moving the lever aft decreases RPM. For Servicing the throttle cable as precribe by Legend 1 of the Powerplant Maintenance Schedule use Oil specification VV-L-800A or Equivalent.

## CHOKE CONTROL

The choke system is a cable controlled system. The choke control knob is located to the right of the front pilot's seat. The choke is used to enrichen the fuel/air mixture to aid in cold engine starts.

## ENGINE BREAK-IN AND OPERATION

It is required that the proper engine break-in procedures be followed exactly as described in the Rotax Operator's Manual. Any deviation from this procedure could cause engine malfunction and/or failure. It is also suggested that continuous engine operation at RPM's above 6300 RPM for periods in excess of 5 minutes be avoided.

## FUEL/OIL MIXTURE

The fuel to oil mixture ratio is 50:1. The fuel must have a minimum rating of 83 octane. The oil must meet or exceed B.I.A. or T.C.W. specifications. The oil container must be marked BIA-TCW-2 cycle. The mixing procedure should be followed as described in the Rotax Operator's Manual.

## Air Filter

The Air Filters for the carburators should be cleaned as precribled by Legend 1 of the Powerplant Maintenance Schedule with regular gasoline.

## IGNITION-STARTER SYSTEM

The ignition is a dual CDI type; twin spark plugs per cylinder. The spark plug used is an NGK B8ES (or equivalent). The ignition switch is a key type switch located to the right side of the of the instrument panel. the switch must be in the "both positon while operating, the "L" and "R" postions are for checking to see if both cdi systems are working. Do not fly if rpm drop exceeds 300 rpm at 3000 rpm during run up prior to flight. The starter is a manual mechanical rewind starter. The starter cord condition must be checked every 10 hours and replaced when worn or frayed. DO NOT operate the engine if the rewind starter is defective. Refer to the Rotax Operator's Manual for specific information. Electric start is optional.

## CARBURETOR AND PRIMING SYSTEM

A Bing carburetor is used on the engine. This is a piston type carburetor with float chamber. The carburetor is fed by an engine driven vacuum fuel pump. Refer to the Rotax Operator's Manual for specific information on carburetor adjustment and care. When Servicing the Carburator as precribed in Legend 1 of the Powerplant Maintenance Schedule remove the fuel bowl; drain, clean and replace.

## ENGINE INSTRUMENTS

The aircraft is equipped with a Tachometer, Water Temperature and Hour meter located in the instrument panel in the front seat only. The instruments displays engine RPM and water temperature in degrees Fahrenheit, and an approximation of engine time in hours. . The maximum authorized RPM is 6500 RPM (GT500) and must never be exceeded. . The water temperature is actually a result of the throttle setting, carburetor fuel/air mixture, air flow over the engine, outside air temperature, engine timing, and general engine condition. If a higher than normal temperture is indicated, the throttle should be retarded to a position that causes a decrease in the instrument reading. In any case, the water temperture must not be allowed to exceed 180f(80C) degrees.

## PROPELLER

The aircraft has a wooden, two-bladed, fixed pitch propeller. The diameter is 68 inches(1727mm) and the designated pitch is; 38in.(965mm) (GT500). The GT500 uses a Helical Gear reduction drive. The engine-to-propeller reduction ratio of 2.58 to 1.

## FUEL SYSTEM

The fuel system consists of a 8.5 gallon(32.2 litres) fuel tank, fuel filter, carburetor and engine driven vacuum fuel pump. A fuel shut off valve is located on the rear of the tank. The fuel tank is mounted in the root of the wing and is secured by adjustable straps to permit . The tank is vented at the top. The vent must be unobstructed to allow for proper operaton of the fuel system. CAUTION: Failure to ensure fuel tank venting will result in Engine Failure! The see- through fuel filter is located in the fuel line between the fuel tank and the fuel pump. It should be inspected prior to each flight to ensure that it does not obtain contaminents. The see-through fuel line must also be inspected for contaminents. If contaminents exist, the fuel system must be drained and flushed prior to running the engine. A fuel drain valve is located in the bottom of the tank. Drain a small amount of fuel before each flight to inspect for water and contaminents. Make sure fuel valve is shot off before flight.

## BRAKE SYSTEM

The aircraft is equipped with a nose wheel brake. The brake pedal is located slightly below and to the right of the right rudder pedal. When depressed, a friction plate is pressed on the nose wheel tire. The braking effectiveness is determined by the amount of pressure applied to the brake pedal, the amount of weight on the nose wheel, and the type of surface on which the nose wheel tire is rolling. Braking should be kept to a minimum since it imposes higher than normal loads on the nose gear structure. The use of proper taxi speeds and the selection of proper runway lengths will extend the service life of the landing gear system.

## AIRSPEED INDICATOR

The aircraft is equipped with an airspeed indicator located in the instrument panel. It is calibrated in miles per hour. Limitation and range markings. The airspeed indicator operates by displaying the difference in pressure of ram air entering through the pitot tube located on he nose of the aircraft, and static air pressure inside the instrument. In order to operate properly, the pitot tube located on the nose of the aircraft and static port ( on the left side of the forward fusalage must be free of obstructions. The airspeed indicator MUST NOT be used as the SOLE reference of actual airspeed since it is subject to variation and error. The feel and sound of the aircraft should also be considerated in the determination of actual airspeed.

LABELS AND PLACARDS

The following Labels and Placards contain important information needed for proper operation of the Quicksilver GT.

---

**CAUTION**

THOROUGH PREFLIGHT INSPECTION REQUIRED. USE GUIDELINES SUPPLIED IN THE PREFLIGHT SECTION OF YOUR OWNERS MANUAL AND YOUR OWN GOOD JUDGMENT. FLY AT YOUR OWN RISK.

Copyright © 1988, Quicksilver Enterprises DOC# 846-1 'A'

**NOTICE**

For this vehicle to qualify as an ultralight (ref. FAR part 103) it must be equipped with a pilot recovery system approved by Quicksilver Enterprises.

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**CAUTION**

Monitor your fuel level to ensure an adequate reserve for a safe landing.

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**PASSENGER WARNING**

This aircraft is amateur-built and does not comply with the Federal Safety Regulations for "standard aircraft."

**NOTICE**

THE MARKINGS AND PLACARDS INSTALLED IN THIS VEHICLE CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS VEHICLE. OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS VEHICLE ARE CONTAINED IN THE OWNER'S MANUAL.

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**IMPORTANT**

**50:1**

GASOLINE/OIL MIXTURE ONLY

**DANGER**

**PROPELLER ARC**

# WARNING

**ULTRALIGHT AND EXPERIMENTAL AIRCRAFT FLIGHT CAN BE DANGEROUS. FLY AT YOUR OWN RISK.**

**FLIGHT LIMITATIONS OF QUICKSILVER ENTERPRISES PRODUCTS**

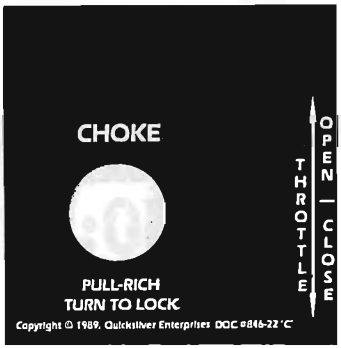
A complete ground school and flight instruction program through an authorized Quicksilver Dealer and thorough review of the owners manual is required before attempting flight. For safety, it is essential to follow the owner's manual recommendations pertaining to the assembly, maintenance and operation of this aircraft. Operation not in strict accordance with the owner's manual may be unsafe, dangerous, or even fatal.

**THIS VEHICLE IS NOT APPROVED FOR AEROBATIC MANEUVERS. PITCH MAY NOT EXCEED 30° AND THE ANGLE OF BANK MAY NOT EXCEED 60°. SPINS ARE PROHIBITED. STEEP LOW LEVEL TURNS SHOULD BE AVOIDED. ALWAYS FLY WITHIN POWER OFF GLIDING DISTANCE OF A SAFE LANDING AREA. OPERATION IN ACCORDANCE WITH FEDERAL AVIATION ADMINISTRATION REGULATION REQUIRED. ALWAYS EXERCISE DUE CARE AND REASONABLE JUDGMENT. FLIGHT SHOULD ONLY BE ATTEMPTED IN ACCEPTABLE AND SAFE WEATHER CONDITIONS AND WHEN YOU AND YOUR VEHICLE ARE IN AN AIRWORTHY CONDITION.**

Ultralight and experimental aircraft flight involves travel in three dimensions. Such activity is subject to mishap, injury and even death. The pilot acknowledges these dangers and attempts flight strictly at his/her own risk. Aluminum and other material components will conduct electricity. DO NOT FLY in the vicinity of power lines, electrical storms, ground cables, or other obstructions. Contacting and/or coming near such obstacles or storms is extremely hazardous and can cause serious or fatal injury.

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DOC #846-18-B




## EXPERIMENTAL
## AMATEUR-BUILT AIRCRAFT

MODEL

SERIAL NO. EMPTY WT.

DATE OF MFG. GROSS WT.

ENGINE H.P.

BUILT BY

NAME

ADDRESS

CITY & STATE

**IMPORTANT**

Vehicle Owner

If you are not the original owner of this vehicle, write to "SERVICE BULLETIN INFORMATION"

P.O. Box 1572, Temecula, CA 92390 U.S.A.
(714) 676-6886 Telex: 499-0565
FAX: (714) 676-4883

**QUICKSILVER ENTERPRISES, INC.**

Model QUICKSILVER GT500

Serial No. GT500

P.O. Box 1572, Temecula, CA 92390 USA
(714) 676-6886 Telex: 499-0565 FAX: (714) 676-4883

# EXPERIMENTAL

# WARNING

## SOLO FLIGHT FROM FRONT SEAT ONLY

**Do Not Fly Pilot In Command or Give Flight Instruction From Rear Seat Unless Equipped With Rear Seat Airspeed Indicator.**

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DOC #906-05




## FLIGHT SPEEDS

QUICKSILVER GT500

| CONDITION | FLAP SETTING | SPEED MPH | SPEED KNOTS |
|---|---|---|---|
| Minimum Climb to 100' AGL | 0-30 | 43 | 37 |
| Va Maneuvering | 0 | 80 | 69 |
| Vne Never Exceed | 0 | 103 | 89 |
| Vfe Never Exceed | 10-30 | 54 | 47 |
| Minimum Approach Below 100' AGL | 0-30 | 43 | 37 |

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DOC #906-03

## INTRODUCTION

Welcome to the world of Light Recreational Aircraft. We wish to thank you for choosing the QUICKSILVER GT 500 , a product we feel represents the State of the Art in this field of aviation.

In construction of your QUICKSILVER GT 500 , it is ESSENTIAL that you build the aircraft in strict accordance with these Assembly Instructions. We have prepared it in a step-by-step form to assist your construction process. PLEASE pay close attention to detail and the sequence of assembly while allowing plenty of time to complete each sequence.

## CONSTRUCTION NOTES

These Assembly Instructions descibe and illustrate the recommended sequence of assembly of your QUICKSILVER GT 500.

In each sequence we will show sub-assemblies FIRST, usually in order of construction. There is a reason for this. Each sub-assembly will incorporate more and more complex operations.

Please read COMPLETELY through the Assembly Instructions at least once to familiarize yourself with our terminology and method of construction.

Whenever possible, the illustrations show the relative position of the part you will be working on. In some instances we will show a part with correct orientation (the right way up) when it's relative position is upside-down. In those particular instances you will be notified on the illustration.

Pay particular attention to the "NOTES" and sections marked "CAUTION", "IMPORTANT" or "ESSENTIAL", as well as "AS ILLUSTRATED". Please follow these instructions. We have specific reasons for assembling something that particular way.

We have Factory Assembled some of the major components leaving you with relatively little drilling, riveting, filing and shaping to complete the assembly of this kit.

While it is possible to complete this kit in a relatively short period of time, accuracy and thoroughness are factors more important than the time spent constructing this aircraft. Care and patience will be rewarded by better control response, higher reliability and a better looking QUICKSILVER GT 500 which will be a credit to both of us.

We sincerely hope you enjoy the experience of constructing your own QUICKSILVER GT 500 aircraft.

## * PARTS LIST INTERPRETATION *

In each sequence, when we call out an item in the text we will give it an Item Number which is repeated on the illustration and keys with the Parts List.

Text Example: "Lay out the Left Wing Cover (1).."

If that item is NEW in the sequence it will have a Part Number in the List which matches the part to be used.

Parts List Example:

| Pt. | P.N. | Description. |
|---|---|---|
| 1. | 45674 | LEFT Wing Cover. |

If the Part has been:

1. Previously Sub-assembled in an earlier sequence.
2. Factory Installed.
3. Called out for identity .
4. Is an integral piece of another item.

Then it will appear in the Parts List with a dotted line after the Item number.

Example:

| Pt. | P.N. | Description. | |
|---|---|---|---|
| 1..... | | LEFT Wing Cover. | (previously sub-assembled). |
| 2..... | | Nut Plate. | (factory installed). |
| 3..... | | Aileron T.E. | (identifies a part). |
| 4..... | | Knurled Nut. | (an integral part of the Ignition Switch). |

Note also that while a Part may be identified (1) on the page which you are reading, it may be identified differently three pages later as (16), ten pages later as (5) and so on - for the same Part .

REMINDER: Each page, in each sequence, is an independent unit.

## CONSTRUCTION NOTES - CONT.

## NICO SLEEVE GUAGE PROCEDURE

**********
ESSENTIAL PROCEDURE!
**********

The Nico Sleeve Gauge (1) supplied with the kit, is used during initial Parts Inventory to verify the accuracy of the Wire Swages (2) on all flying and control Wires on the aircraft.

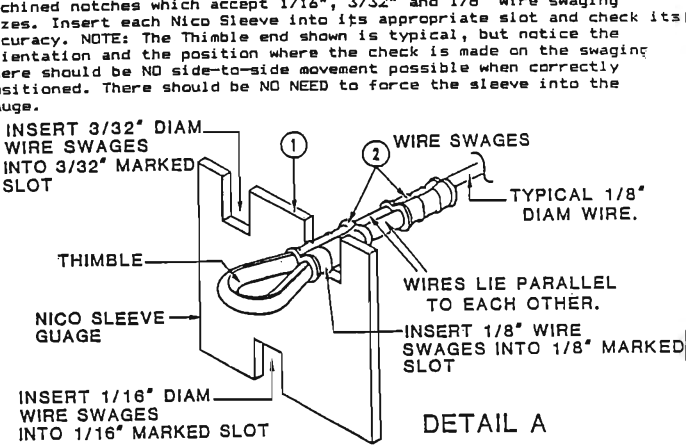
ALL Wire Swages (2) whether ending in Cable Bushings, Flat or angled Tangs or Thimbles MUST be checked with this Gauge.

You must ensure that where a wire passes around a Thimble (a typical example of which is shown below) its captured-end lies parallel to and side-by-side with the rest of the Wire and be untwisted within the Swages (2) and that the shape of each Swage (2) is symmetrical. Additionally you must check the whole length of the Wires for "nicks" or cuts in their jackets.

DO NOT USE Wires which show signs of transit damage, or that have broken or untwisted individual wires which make up a cable!

If you have questions about either this procedure or the results of your inspection - contact your Eipper Dealer.

1. Refer to Detail 'A'. The Nico Sleeve Gauge (1) has three precision machined notches which accept 1/16", 3/32" and 1/8" wire swaging sizes. Insert each Nico Sleeve into its appropriate slot and check its accuracy. NOTE: The Thimble end shown is typical, but notice the orientation and the position where the check is made on the swaging. There should be NO side-to-side movement possible when correctly positioned. There should be NO NEED to force the sleeve into the Gauge.




**********
WARNING! NEVER USE SUBSTITUTES. FIT WIRES ONLY IN THEIR DESIGNATED POSITIONS!
**********

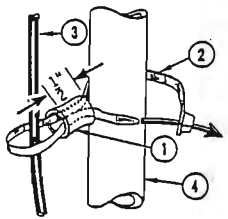
## CONSTRUCTION NOTES - CONT.

### STAND-OFF ASSEMBLY

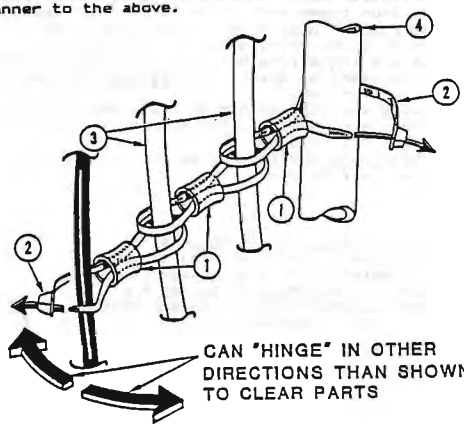
This is an anti-vibration fitting used to isolate Gas Lines, Throttle Cable, Teleflex Cable and some Electrical Wires throughout the aircraft. The exact locations and numbers used are detailed in the relevant sequence.

1. Refer to Detail 'A', which shows a single Stand-off in a typical application. Cut a 1/2" (12.7mm) piece of Fuel Line (1). Thread a 7" Nylon Tie-Wrap (2) around a typical part (3), thru the Fuel Line (1) and around the Airframe tube (4) as shown. Pull tight, cut off the excess and touch the cut end with the hot knife to remove sharp edges.

2. Refer to Detail 'B', which shows a typical multiple Stand-off. Fabricate in a similar manner to the above.




DETAIL 'A'




DETAIL 'B'

| Pt. | P.N. | Description. |
|---|---|---|
| 1. | 30223 | Fuel Line 35". |
| 2. | 30480 | 7" Nylon Tie-wrap. |
| 3. | | .....Typical part. |
| 4. | | .....Typical Airframe Tube. |

*** NOTE: The 35" Fuel Line is used in the Forward Fuselage. Use the remaining piece for "Stand-Off" assembly.

# THE NUTS & BOLTS OF THE GT

All Bolts used in the airframe of this kit are Aircraft Quality and are either "Graded" to military specification or they conform to the standards of the S.A.E. (Society of American Engineers).

The most commonly used bolts in this kit are fine-thread "AN" bolts.

Coarse Thread Bolts in this kit are refered to as "Grade 5" Bolts and are used in specific locations throughout the aircraft, their positions will be shown in the text. IT IS DANGEROUS to substitute them for any other Bolt.

## BOLT TIGHTENING

NEVER overtighten a Bolt. Tighten ONLY when and as instructed. Particular care is necessary when tightening bolts which pass through aluminum tubes with no solid internal support.

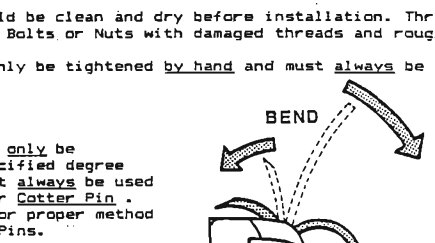
Be particularly careful when installing all Forkbolts or Eyebolts in the Wing, Aileron, Elevator, Stabilizer or Rudder tubes.

Before installing bolts, check that the grip-length is correct. When using Washers, ensure that at least one-and-a-half bolt thread extends out of the nut.

Bolts and Nuts should be clean and dry before installation. Threads should not be oiled. Bolts or Nuts with damaged threads and rough ends should NOT be used.

Wing Nuts should only be tightened by hand and must always be used with a Safety Ring.

Castle Nuts should only be tightened to the specified degree of tightness and must always be used with a Safety Ring or Cotter Pin . SEE Illustration for proper method of bending Cotter Pins.




NOTE: When Castle Nuts are tightened, the Safety Ring or Cotter Pin Holes may not line up with the slots in the nuts when the Torque setting is reached. BACK OFF to the nearest slot. The Castle Nut must NEVER be overtightened to permit lining up the Safety Hole with the next tighter slot!

**********

WARNING!

BOLTS WHICH ARE SUBJECT TO ROTATION IN FLIGHT WILL USE "CASTLE" NUTS. A CASTLE NUT RELIES ON A SAFETY RING OR COTTER PIN TO PREVENT IT BACKING OFF. ALWAYS ENSURE CASTLE NUTS ARE SECURED WITH A SAFETY RING OR COTTER PIN!

**********

## BOLT TIGHTENING - CONT.

### SPECIFIED TORQUE VALUES

| | in.lbs. | ft.lbs. | Newton Meter |
|---|---|---|---|
| 3/16"....(AN3)..4.8mm | 20-25 | 1.5-2.0 | 2.25-2.75 |
| " with thin locknut | 12-15 | 1.0-1.25 | 1.25-1.75 |
| 1/4" ....(AN4)..6.35mm | 50-70 | 4.0-5.75 | 5.5-8.0 |
| " with thin locknut | 30-40 | 2.5-3.25 | 3.5-4.5 |
| 1/4"-20 thread (Coarse) 6.35mm | 40-50 | 3.25-4.0 | 4.5-5.5 |
| 5/16"....(AN5)...7.94mm | 100-140 | 8.25-11.5 | 11.25-15.75 |
| " with thin locknut | 60-85 | 5.0-7.0 | 6.75-9.5 |
| 7/16"....(AN7)...11.11mm | 450-500 | 37.5-41.5 | 51.0-56.5 |

### RUN-ON TORQUE and PROPER TORQUE.

Run-on Torque is the amount of resistance encountered when you thread a nut onto a bolt until the bolt threads appear through the nut.

When you thread a new Nut onto a Bolt, resistance is felt due to minute machining differences. It is sometimes possible to reach the Torque Values in the above chart even before the Bolt threads appear through the Nut, particularly when working with Locknuts. The effect is that the Torque Wrench shows you the "correct" torque, yet this can be a completely false reading and the nut and bolt will not be correctly tightened!

Therefore, when reading any Torque Specification in this manual we will expect you to use Proper Torque.

FORMULA

PROPER TORQUE = RUN-ON TORQUE + TORQUE VALUE

EXAMPLE

Using the Torque Wrench, run a 3/16" (AN3) Locknut onto a (AN3) Bolt until the threads just begin to appear past the nut. Note the reading on the Torque Wrench - (Lets say, it reads 8 in/lbs.). That reading is the "Run-on Torque".

In the Specified Torque Value chart above, you will see that the Torque Value for AN3 is 20-25 in./lbs. ADD that to the Torque Wrench reading (8 in./lbs). Therefore, this AN3 bolt will be correctly tightened when the Torque Wrench shows a reading of 28-33 in./lbs. This is PROPER TORQUE.

IMPORTANT: Nylock Nuts and Locknuts should never be used more than twice as they become less vibration resistant with each removal.

When using the Torque Wrench, apply a smooth, even pull. If chattering or a jerking motion occurs during final torque, back off and re-torque.

## ROTAX ENGINES:
## TORQUE SPECIFICATIONS

| | in.lbs. | Newton Meters |
|---|---|---|
| Cylinder Head Nuts.....M8..... | 210 | 24 |
| Crankcase Screws.....M8..... | 210 | 24 |
| Magneto Housing Nut.....M18x1,5 | 700 | 80 |
| Fan Nut.....M16x1,5 | 620 | 70 |
| Crankcase Nuts (or screws) M10.... | 354 | 40 |
| Exhaust Socket Screws.....M8..... | 210 | 24 |

Formula : To convert (in.lbs) to (ft.lbs): Divide by 12

## SAFETY WIRING

Certain Bolts on this aircraft must be Safety Wired. The wiring is arranged so that if a Nut or Bolt begins to loosen, the force applied to the wire is in the tightening direction.
CAUTION: Use only Aircraft-quality Safety Wire!

The following is the recommended method:
Tighten the Bolts to the Torque values specified in the relevant text. Ensure that the Safety Wire holes are aligned as shown. NEVER overtighten or loosen a torqued Bolt to align Safety Wire holes. Careful study of the illustration shows that:

Example 1 shows Safety Wiring thru Springs - as on the Exhaust System.
Example 2 shows Wiring to certain Castle Nuts and studs - NOTE: There is no loop around the Nut.
Example 3 shows several Bolts wired together - as on the Propeller.
Example 4 shows a single threaded component wired to a housing or lug.


1


2


3


4

# AN BOLT GAUGE

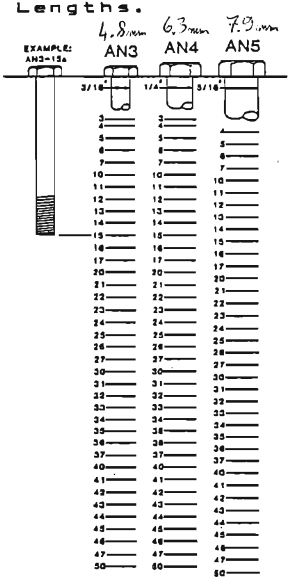
**Use this Gauge to determine AN Bolt Sizes and Lengths.**

DO NOT USE Substitutes!
Call your Eipper Dealer for replacements, whenever necessary.

AN3 = 3/16" diameter Shank.

AN4 = 1/4" diameter Shank.

AN5 = 5/16" diameter Shank.




**CAUTION: This Gauge is inappropriate for measuring Grade 5 Bolts.**

# PROPELLER

**********
CAUTION: It is DANGEROUS to work on a Propeller with the High Tension Lead connected to the Spark Plug of the Engine!!
**********

The Propeller supplied with this kit is a precision-made component incorporating the highest standards of manufacture. While it is extremely strong, reliable and well balanced as supplied, it is recommended that before mounting, it should be fine-balanced using Professional balancing techniques.

It must be emphasised that the mounting procedure must be followed closely and carefully.

The Propeller - Which way around?

When looked at end-on, you will see that the Propeller blades are airfoil-shaped - curved one side, flat the other. On this aircraft, the FLAT SURFACE of the Propeller blade FACES AFT!!

Propeller Mounting Bolts

There are six special Bolts for use only on the Propeller. They are AN4H-21a (GT 400) and 1/4" x 20 Coarse Thread (GT 280). The heads of the Bolts are cross-drilled. Push each Bolt in turn thru the holes in the Propeller and then remove them again. They should be a tight fit. DO NOT use excess force.

IF the Bolts will not pass thru the Propeller - perhaps due to local humidity - the holes may be Reamed to 1/4". USE EXTREME CAUTION.

## HOT KNIFE

Use extreme care when using the Hot Knife to cut the Template holes in flying surface Covers. A good Hot Knife at the correct temperature will cut the material as easily as soft butter. Mistakes cannot be corrected! Try cutting Template holes smaller than needed at first, then gradually enlarge to the correct size. In this way, you'll get neater as you gain experience. CAUTION— Don't step on or brush against a Hot Knife when wearing sneakers, it can be very painful!!

## CUSTOM PAINTING

If you wish to custom paint the Pilot Fairing, Seat and Wheel Pants, do it after they have been assembled in sequence; then disassemble, paint and reassemble according to the instructions.

## LOCATING HOLES

When predrilled Tubes have been inserted into Wing and Tail Covers, find the holes as instructed in each sequence. Final locate them with your fingers and push a stick-pin thru the fabric to mark their position.

# GETTING READY

NOTE:
The Assembly & Installation Instructions for the ENGINE (Section 4) will be packaged with the Engine Kit. Locate them and insert them into the Assembly Manual. ** CAUTION : DO NOT attempt to Mount the Engine onto the Airframe until instructed to do so in Final Assembly (Section 7).

Once you have thoroughly read the instructions:

1. Inventory and inspect the component parts of the kit, leaving them in their clear-wrap packaging until ready for use.
2. Assemble the tools required and ensure that they are clean and sharp (See "Tools Needed").
3. Clean your workspace so that it is as dust-free as possible.
4. Always use the specified components and Bolts. NEVER use substitutes. NEVER use non-Eipper Parts (See "AN Bolt Gauge").
5. Check all flying and control Wires with the Nico Sleeve Gauge provided (See "Nico Sleeve Gauge Procedure").
6. Use extreme care when using the Hot Knife to cut the Template holes in flying surface Covers. Mistakes cannot be corrected! (See "Hot Knife").

## SPACE REQUIREMENTS

*NOTE: Throughout this Assembly Manual we have presumed that your work area is about the size of the average Garage - 25'0" long x 15'0" wide x 8'0" high (7.6m x 4.5m x 2.4m).
With careful space management, you should easily be able to separately assemble the Fuselage, Tail Boom and one Wing at a time, then Final Assemble them outside.
If you have more space, it is possible to build both Wings simultaneously - just remember that the full Wing Span on the "Wing Jig" exceeds 30'0" (9.14m) and the overall length of the Quicksilver GT exceeds 20'0" (6.1m).

# TOOLS NEEDED FOR ASSEMBLY

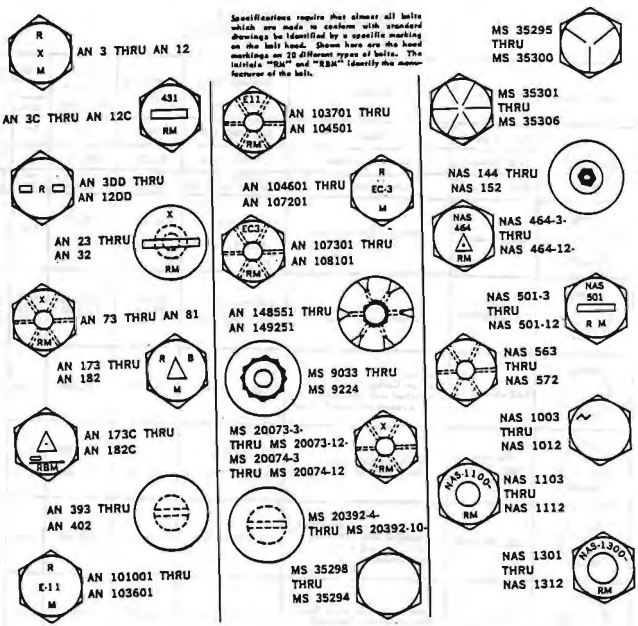
* Allen Hex Bits: 6mm - 1/4" - 1/8"- to fit Torque Wrench.
* Angle Finder (Universal Protractor).
* Awl.
* Bench Vice.
* Cleaning Brush, 1".
* Center Punch.
* Cleaning Fluid.
* Drill Motor or Hand Drill with 1/8"-3/16"-3/8"-5/8"-1/2" Bits.
* Files: Fine Flat,
  : 1/2 Round,
  : Rat Tail.
* Hacksaw with normal and Tube-cutting Blades.
* Hammers: Steel,
  : Leather.
* Hot Knife (or Soldering Iron with Blade Edge).
* Marking Pencil or Pen.
* Pliers: Regular,
  : Long Nose.
* Razor Knife.
* Riveting Tool for 1/8" and 3/16" Rivets.
* Rope, 1/4" Nylon.
* Sandpaper - Medium Grit.
* Scissors.
* Screwdrivers: set of Flat Blade,
  : " " Phillips.
* Sidecutters - one pair.
* Spark Plug Gapping Tool.
* Straight Edge, 6' feet long (2m.).
* Tape Measure - 10'feet (3m.).
* Tape: Electricians,
  : Masking.
* Torque Wrench that registers in.lbs.(or Newton Meters if you work in Metric).
* Torque Wrench that registers ft.lbs (or Newton Meters).
* Vice Grips.
* 3 Weighing Scales each having a capacity of 200lbs.(90 Kg.).
* Wire Crimper.

GT 280 - ONLY:
* Artists Paint Brush & small amount of White Paint. (to number 'V' Belts).
* Socket: 1-1/8" to fit torque wrench.

Wrenches : Open End and Socket - 3/16"-1/4"-5/16"-3/8"-7/16"-1/2" - 9/16"-11/16"
: Metric (for Engine) - 5mm.- 6mm.- 8mm. - 10mm - 11mm.- - 13mm.- 16mm.- 17mm.
: Allen Wrench.....- 6mm. - 1/8" - 1/4".

Also some strips of old Carpet, or old Bed Sheets, Painters' Drop Sheets or similar protective cover will be useful to keep wings and other parts clean and free from scratches during assembly.

# BOLT HEAD MARKINGS



Our SAE Grade 5 line of cap screws is manufactured from SAE 1038 steel to provide a tensile strength of approximately 135,000 PSI as compared to the 120,000 PSI minimum called for by the SAE Specifications. In actual tests, our Bowma-Torq (formerly SAE Grade 6) cap screws produced tensile strength which met the 150,000 PSI requirement for SAE Grade 8. Finally, our Bowmalloy offers a proof load which is 37 1/2% greater than Grade 8, the highest SAE rating established for cap screws.

## SAE GRADE MARKINGS FOR STEEL BOLTS AND SCREWS

| Grade Marking | Specification | Material | Bolt and Screw Size, in. | Proof Load, Psi. | Tensile Strength min., psi. | Rockwell Hardness Min. | Rockwell Hardness Max. |
|---|---|---|---|---|---|---|---|
|  | SAE–Grade 0 | Steel | 1/4 thru 1 1/2 | — | — | — | — |
| | SAE–Grade 1 | Low Carbon Steel | 1/4 thru 1 1/2 | 33,000 | 60,000 | — | B 95 |
| | SAE–Grade 2 | Low Carbon Steel | 1/4 thru 3/4<br>Over 3/4 thru 1 1/2 | 55,000<br>33,000 | 74,000<br>60,000 | —<br>— | B 100<br>B 95 |
|  | SAE–Grade 3 | Medium Carbon Steel, Cold Worked | 1/4 thru 1/2<br>Over 1/2 thru 5/8 | 85,000<br>80,000 | 110,000<br>100,000 | B 93 | B 104 |
|  | SAE–Grade 5 | Medium Carbon Steel, Quenched and Tempered | 1/4 thru 3/4<br>Over 3/4 thru 1<br>Over 1 thru 1-1/2 | 85,000<br>78,000<br>74,000 | 120,000<br>115,000<br>105,000 | C 23<br>C 22<br>C 19 | C 32<br>C 32<br>C 30 |
|  | SAE–Grade 5.1 | Low or Medium Carbon Steel, Quenched and Tempered with Assembled Lock Washer | Up to 3/8 incl. | 85,000 | 120,000 | C 23 | C 40 |
|  | Formerly SAE–Grade 6 | Medium carbon steel. Quenched and tempered. | 1/4 thru 5/8<br>Over 5/8 thru 3/4 | 110,000<br>105,000 | 140,000<br>133,000 | C 30<br>C 28 | C 36<br>C 36 |
|  | SAE–Grade 7 | Medium Carbon Alloy Steel, Quenched and Tempered, Roll Threaded After heat treatment | 1/4 thru 1 1/2 | 105,000 | 133,000 | C 28 | C 34 |
|  | SAE–Grade 8 | Medium Carbon Alloy Steel, Quenched and Tempered | 1/4 thru 1 1/2 | 120,000 | 150,000 | C 32 | C 38 |
|  | Exceeds SAE–Grade 8 | Special Ultra Hi-Strength Alloy Steel Quenched and Tempered | 1/4 thru 1 1/2 | 165,000 | 185,000 | C 37 | C 41 |

# Simplified AN Chart

AN 3 THRU 20 BOLT-AIRCRAFT

AN 21 THRU 36 BOLT-CLEVIS

AN 40 THRU 49 BOLT-HEX HD.

AN 70 BOLT - CARRIAGE

AN 73 THRU 81 BOLT-DRIL. HD.

AN 83 THRU 86 BOLT-CLS. TOL.

AN 106 SHACKLE - SCREW PIN

AN 173 THRU 186 BOLT, CLS. TOL.

AN 310 NUT - CASTLE (AIR FRAME)

AN 315 NUT - PLAIN (AIR FRAME)

AN 316 NUT - CHECK

AN 320 NUT - CASTLE, SHEAR

AN 325 NUT - HEX, PLAIN (NAS)

AN 330 NUT - CASTLE (MS)

AN 335 NUT - PLAIN HEX (USS)

AN 340 - LIGHT HEX (MS)

AN 341 NUT HEX, LIGHT, BRASS (ELEC)

AN 345 NUT HEX, LIGHT (SAE)

AN 350 NUT WING

AN 356 NUT - HEX, PLAIN (ENGINE)

AN 363 NUT - HEX, SELF LOCKING (PH TERM)

AN 364 NUT - HEX, SELF LOCKING, THIN

AN 365 NUT - HEX, SELF LOCKING

AN 380 PIN - COTTER

AN 381 PIN - COTTER, STAINLESS

AN 420 THRU 470 RIVETS, VARIOUS

AN 500 SCREW - FILL. HD. (USS)

AN 501 SCREW - FILL. HD (SAE)

AN 502 SCREW - FIL. HD. MCH. ALLOY STL. (SAE)

AN 503 SCREW - FIL. HD. MCH. ALLOY STL. (USS)

AN 504 SCREW - RD. HD. SELF TAP MCH.

AN 505 SCREW - 82° FL. HD. MCH. (USS)

AN 506 SCREW - 82° FL. HD. SELF TAP MCH.

AN 507 SCREW - 100° FL. HD MCH. (USS & SAE)

AN 508 SCREW - RD. HD. MCH. BRASS (ELEC)

AN 509 SCREW - 100° FL. HD. MCH. ALLOY STL. (SAE)

AN 510 SCREW - 82° FL. HD. MCH. (SAE)

AN 515 SCREW - RD. HD. MCH. (USS)

AN 520 SCREW - RD. HD. MCH. (SAE)

AN 525 SCREW - WASHER HD. MCH. ALLOY STL.

AN 526 SCREW - TRUSS HD. MCH. (USS & SAE)

AN 530 SCREW - RD. HD. TAPPING TYPE "B"

AN 531 SCREW - FL. HD. TAPPING TYPE "B"

AN 535 SCREW - RD. HD. DRIVE TYPE "U"

AN 540 SCREW - LAG

AN 545 SCREW - WOOD RD. HD.

AN 550 SCREW - WOOD, F. H.

AN 560 SCREW - SQ. HD. SET

AN 565 SCREW - HEADLESS SET

AN 532 PLUG - PIPE

AN 935 WASHER - SPRING LOCK

AN 936 WASHER - EX. & INT. TEETH LOCK

AN 960 WASHER - FLAT, SUPER

AN 965 WASHER - FLAT PLAIN (COMMERCIAL)

AN 960 WASHER - FLAT, AIRCRAFT

AN 364 WASHER - FLAT, BRASS (ELEC)