

## FALL 94 NEWSLETTER

FALL ( OR PRE WINTER WE SHOULD SAY ) IS HERE. GET OUT THE WOOL SHIRTS AND GET READY FOR SOME OF THE BEST FLYING WEATHER. IT IS GREAT WHEN THE FSS SPECIALIST SAYS, " CEILING AND VISIBILITY UNLIMITED ALONG YOUR ENTIRE ROUTE OF FLIGHT !"

WE WISH TO WELCOME RICH WYEROSKI TO THE STAFF OF ISLIP AVIONICS. RICH IS AN A + P MECHANIC, HOLDS ATP AND FLIGHT INSTRUCTOR RATINGS. RICH WILL BE WORKING IN SALES, CUSTOMER SERVICE AND IN THE INSTALLATION SHOP. RICH IS A KNOWLEDGEABLE PILOT AND MECHANIC AND WILL BE ABLE TO ANSWER MANY OF YOUR QUESTIONS.

RICH AND FRED HAVE JUST RETURNED FROM THE REGION 1 MEETING OF THE AIRCRAFT ELECTRONICS ASSOCIATION. THEY BRING BACK AN UPDATE ON THE STATUS OF GPS. *GPS-NOW IS THE TIME !*

**DID YOU KNOW** THAT IT IS THE OWNER / OPERATOR'S RESPONSIBILITY TO MAINTAIN THE MAINTENANCE RECORDS FOR AN AIRCRAFT ? THAT IT IS THE PILOT'S RESPONSIBILITY TO VERIFY THAT THE LOG BOOKS, 337 FORMS AND WEIGHT AND BALANCE ARE COMPLETE AND CORRECT BEFORE FLYING AN AIRCRAFT ?

**FEATURE JOBS** THE ISLIP AVIONICS STAFF RECENTLY COMPLETED AN AVIONICS AND SYSTEMS UPGRADE TO A PIPER PATHFINDER, N3434Q OWNED BY RICK KASPER. THIS UPGRADE INCLUDED A KN-64 DME, AN S-TEC PITCH STABILIZATION SYSTEM ( PSS ), A NAT INTERCOM, A B.F. GOODRICH WX-900 STORMSCOPE, A PRECISE FLIGHT STANDBY VACUUM SYSTEM AND AN ELECTRONICS INTERNATIONAL EGT / CHT MONITOR. HAPPY FLYING RICK! RECENTLY AT ISLIP AVIONICS WE HAVE HAD TWO FAA APPROVED GPS FOR IFR INSTALLATIONS. THEY WERE FOR TODD BLACK AND DAN LEHNER. BOTH TEST FLIGHTS MADE STAR WARS ACCURACY SEEM BELIEVABLE ! MAY THE FORCE BE WITH THEM !

**UPCOMING EVENTS** WE MUST SINCERELY APOLOGIZE TO YOU FOR NOT BEING ABLE TO SCHEDULE THE TCAD, STORMSCOPE AND GPS SEMINARS THAT WE HAD MENTIONED IN OUR LAST NEWSLETTER. THE MANUFACTURERS SEEM TO HAVE CUT BACK ON PERSONNEL MAKING IT MUCH MORE DIFFICULT TO SCHEDULE THESE EVENTS. GARMIN HAS PROMISED US THAT WE ARE NEAR THE TOP OF THE LIST FOR A GPS SEMINAR. THEY HAVE JUST HIRED A NEW REPRESENTATIVE FOR THE NORTH EAST. WE WILL KEEP YOU POSTED.

**FROM THE PILOT'S SEAT** GPS IS HERE TO STAY. THE ACCURACY IS FAR BETTER THEN EVEN I ( THE SKEPTIC ) COULD IMAGINE. THIS TECHNOLOGY IS FABULOUS. PLEASE READ FURTHER ON THE GPS SYSTEMS. NOW IS THE TIME TO CONSIDER GPS ! THANK YOU FOR YOUR CONTINUED SUPPORT.

**HAPPY FLYING,  
FRED**

### **GPS - NOW IS THE TIME !**

FOR THE LAST 2 YEARS WE HAVE BEEN TELLING OUR MANY LOYAL CUSTOMERS TO DELAY UPGRADING FROM LORAN TO GPS. NOW IS TIME TO START SERIOUSLY CONSIDERING TRADING IN YOUR OLD LORAN FOR A NEW GPS. THIS WILL BE A LENGTHY REPORT , PLEASE READ ON.

WE ARE FREQUENTLY ASKED, " WHAT IS GOING TO HAPPEN TO LORAN C?" THERE HAS BEEN A LOT OF TALK THAT THE U.S. COAST GUARD ( WHO OPERATES LORAN C ) WILL SHUT THE SYSTEM DOWN IN LESS THEN 2 YEARS. I THINK THAT THIS WILL TAKE 5 YEARS TO OCCUR. I DO FEEL THAT LORAN OUTAGES WILL OCCUR MORE AND MORE OFTEN AS TIME GOES ON. LORAN C EQUIPMENT HAS ALREADY SIGNIFICANTLY DROPPED IN VALUE. THE MORE TIME THAT PASSES, THE LESS VALUE THERE WILL BE.

WE ARE ASKED, " HOW IS GPS DIFFERENT FROM LORAN C ? " FROM THE PILOT'S POINT OF VIEW, IN REGARDS TO OPERATING THE EQUIPMENT, THERE IS LITTLE OR NO DIFFERENCE. YOU MANIPULATE A DATA BASE TO TELL THE UNIT WHERE YOU WISH TO GO. THAT IS WHERE THE SIMILARITIES END. LORAN C IS A GROUND BASED SYSTEM, ORIGINALLY DESIGNED FOR MARINE NAVIGATION. LORAN DATES BACK TO THE 1950'S ( AND BEFORE ) AND IS OPERATED BY THE U.S. COAST GUARD. A BASIC LORAN GROUND SYSTEM CONSISTS OF A MASTER AND 2 OR MORE SECONDARY GROUND STATIONS THAT EACH SEND OUT A TIMED SIGNAL. THIS IS RECEIVED AND PROCESSED BY THE AIRBORNE RECEIVER AND CONVERTED TO LATITUDE AND LONGITUDE. LORAN IS SUBJECT TO SEVERAL PROBLEMS THAT DEGRADE ITS ACCURACY OR MAKE IT UNUSABLE. P-STATIC AND SEVERE WEATHER ARE TWO SUCH PROBLEMS.

**GPS** IS A SPACE BASED SYSTEM CONSISTING OF 25 SATELLITES IN FIXED ORBITS. EACH SATELLITE SENDS OUT A SIGNAL. THESE SIGNALS ARE RECEIVED BY THE AIRBORNE RECEIVER AND CONVERTED TO LATITUDE AND LONGITUDE ( AND ALTITUDE IF ENOUGH SATELLITES ARE VISIBLE.) IT TAKES A MINIMUM OF 3 SATELLITES TO GIVE A REASONABLY ACCURATE 2 D ( LAT / LONG ) POSITION. A MINIMUM OF 4 ARE REQUIRED FOR 3D ( LAT /

LONG / ALT.) GPS IS NOT SUSCEPTIBLE TO WEATHER PHENOMENON OR TO P-STATIC. GPS PROVIDES EXCELLENT ALL WEATHER NAVIGATION.

THERE IS A TREMENDOUS AMOUNT OF INFORMATION THAT WE WISH FOR YOU TO BE AWARE OF. SEVERAL MONTHS AGO, THE FAA FINALLY PUBLISHED ADVISORY CURRICULAR 20-138. THIS DEALS WITH THE INSTALLATION OF VFR AND IFR GPS SYSTEMS. IT IS A FAIRLY WELL WRITTEN DOCUMENT AND MAKES EXCELLENT READING IF YOU HAVE INSOMNIA !

THE ACCURACY OF GPS IS UNCANNY. WE HAVE DONE A NUMBER OF TEST FLIGHTS RECENTLY AND HAVE SEEN CONSISTENT ERRORS OF AS LITTLE AS 60 FEET !

A COUPLE OF IMPORTANT NOTES ABOUT ALL GPS INSTALLATIONS:

- 1) ALL INSTALLATIONS REQUIRE FAA FIELD APPROVAL ON FORM 337.
- 2) ALL INSTALLATIONS REQUIRE A TEST FLIGHT (VFR OR IFR .)
- 3) ALL GPS ANTENNAS MUST BE TOP MOUNTED.

GPS UNITS TAKE UP THE SAME 2 INCH PANEL SPACE AS MOST LORANS. WE STRONGLY FEEL THAT GPS NAVIGATION IS THE FUTURE. NDB'S WILL START BEING PHASED OUT WITH IN THE NEXT 2 TO 3 YEARS. WE FEEL THAT VOR AND ILS EQUIPMENT WILL BE AROUND FOR AT LEAST 7 TO 10 YEARS AND PROBABLY LONGER. WE DO HOWEVER, EXPECT THAT HAVING DUAL VOR RECEIVERS WILL SOON BE A THING OF THE PAST. WE ARE READY NOW TO CONSIDER A TYPICAL AVIONICS INSTALLATION TO CONSIST OF A COM / NAV WITH VOR AND ILS CAPABILITIES AND A COM / GPS WITH IFR APPROVALS ! COM / GPS MAY BE ONE BOX OR 2 SEPARATE BOXES.

THE ADVISORY CIRCULAR BREAKS GPS DOWN IN TO 2 CATEGORIES. **VFR** AND **IFR**. TO ADD MORE CLARITY TO THIS DISCUSSION, I AM GOING TO USE 3 CATEGORIES **VFR ONLY**, **TERMINAL AND ENROUTE IFR** AND **TERMINAL, ENROUTE AND NON- PRECISION APPROACH IFR**.

**VFR ONLY**- FIRST OF ALL I WILL STATE THAT MOST LORAN INSTALLATIONS ARE VFR ONLY. YES, MANY OF YOU USE THESE FOR SUPPLEMENTAL IFR NAVIGATION. THIS IS PERFECTLY LEGAL. VFR ONLY GPS SYSTEMS ARE THE SAME. WHAT YOU **CAN NOT** DO IS FILE IFR / ROMEO OR ACCEPT A / ROMEO CLEARANCE WITH A VFR ONLY BOX. MOST OF THE VFR UNITS AVAILABLE TODAY WILL HAVE NO UPGRADE PATH TO IFR CERTIFICATION. A FLIGHT CHECK IS REQUIRED. THESE VFR ONLY GPS UNITS RANGE IN PRICE FROM \$ 2,800 TO \$ 4,800. IF YOU WANT GPS NOW, AND WILL WANT IT TO BE CERTIFIED FOR IFR IN THE FUTURE, WE SUGGEST BUYING AN IFR BOX NOW AND HAVING IT INSTALLED " VFR ONLY." VFR INSTALLATIONS ARE USUALLY STAND ALONE AND DO NOT REQUIRE ANY INTERFACE TO A CDI OR ANY ANNUNCIATORS. MANY MANUFACTURERS HAVE UNITS APPROVED FOR VFR ONLY.

**TERMINAL AND ENROUTE IFR** - THIS ALLOWS THE PILOT TO FILE IFR / ROMEO. THIS ALLOWS YOU TO GO " GPS DIRECT " LEGALLY ON AN IFR FLIGHT PLAN. TERMINAL DESCRIBES TWO PHASES OF FLIGHT. FROM DEPARTURE TO THE FIRST FIX (SUCH AS AN INTERSECTION LISTED ON SID ) AND FROM ARRIVAL AT THE FEEDER TO AN APPROACH ( SUCH AS A LISTED ON A STAR ) AND OR TO THE INITIAL APPROACH FIX ( IAF ) FOR A NON-PRECISION APPROACH OR TO THE FINAL APPROACH FIX ( FAF ) THEN COMPLETE THE APPROACH UTILIZING OTHER MEANS ( VOR, ILS OR NDB.) ENROUTE MEANS JUST THAT. FROM HERE TO THERE.

A NUMBER OF MANUFACTURERS HAVE UNITS APPROVED FOR THIS. TRIMBLE ( TNL-2000T ), BENDIX KING (KLN-90A ) AND NORTHSTAR (M3.) GARMIN (GPS-155 ) MEETS THESE REQUIREMENTS AND THEN SOME. I WILL DISCUSS THIS MORE BELOW. MAGELLAN (6-8 MONTHS AWAY ), II MORROW ( STATUS UNKNOWN ), ARNAV ( STATUS UNKNOWN ) AND ASHTECH ( 1 YEAR AWAY ) ALL HAVE UNITS ON THE WAY. NORTH STAR AND BENDIX KING OFFER SOME EXCELLENT TRADE IN PROGRAMS.

TO GET IFR APPROVAL, THE UNIT MUST BE FIRST CONNECTED TO AN APPROPRIATE CDI ON THE PILOT'S INSTRUMENT PANEL. THIS CAN BE A DEDICATED INDICATOR, OR IT CAN BE SWITCHED TO SHARE AN INDICATOR OR HSI WITH AN EXISTING NAV. THIS PART IS TRICKY. ALMOST ALL HSI'S ARE COMPATIBLE. MANY NAV INDICATORS ARE NOT COMPATIBLE. COMPATIBILITY NEEDS TO BE EXAMINED ON A ONE TO ONE BASIS. SECONDLY, A GROUP OF STATUS ANNUNCIATOR LIGHTS MUST BE INSTALLED ON THE PILOT'S PANEL TO ALERT THE PILOT OF THE STATUS OF THE GPS UNIT. THIRD THESE REQUIRE INTERFACE TO THE AIRCRAFT'S ALTITUDE ENCODER. AND FINALLY FLIGHT MANUAL SUPPLEMENT SPECIFIC TO YOUR AIRCRAFT MUST BE PREPARED AND SUBMITTED TO THE FAA FOR APPROVAL. A FLIGHT CHECK IS REQUIRED. IT IS DIFFICULT TO QUOTE PRICES ON THESE UNITS DUE TO THE VARIATIONS IN EACH INSTALLATION. MANY OF THE MANUFACTURERS HAVE PUBLISHED A MAXIMUM UNIT UPGRADE COST TO UPGRADE TO NON-PRECISION APPROACH STATUS WHEN THEY HAVE IT AVAILABLE. USUALLY ABOUT \$ 1,000. THIS ONLY UPGRADES THE BOX NOT THE INSTALLATION.

***TERMINAL, ENROUTE AND NON-PRECISION APPROACH IFR*** ( NPA) TERMINAL AND ENROUTE ARE THE SAME AS ABOVE. PLUS THE ADDITION OF NON-PRECISION APPROACH. NON-PRECISION APPROACH ALLOWS YOU TO FLY A VOR, VOR / DME, NDB OR RNAV OVERLAY APPROACH BASED SOLELY ON GPS. GREAT STUFF ! IT DOES NOT ALLOW OVERLAY LOCALIZER, LDA OR SDA APPROACHES. YOU MUST STILL HAVE THE APPROPRIATE VOR OR NDB EQUIPMENT ON BOARD AND IN OPERATING CONDITION. HOWEVER, THESE NEED NOT BE ON OR MONITORED. SOON ( 6 MONTHS TO 1 YEAR ) WE EXPECT THAT PHASE II WILL BE APPROVED AND THAT YOU WILL NO LONGER NEED TO HAVE THE OTHER EQUIPMENT ON BOARD. YES YOU WILL BE ABLE TO TAKE OUT THAT OLD ADF ! JEPESSEN IS CURRENTLY REISSUING MOST NON-PRECISION APPROACH CHARTS TO ADD THE GPS OVERLAY INFORMATION.

THE FAA IS ALSO PRESENTLY DEVELOPING DEDICATED GPS APPROACHES AT MANY AIRPORTS THAT CURRENTLY HAVE NO IFR APPROACH. WE SHOULD START SEEING THESE SOON. GREAT STUFF !

THE NON-PRECISION APPROACH INSTALLATION IS SIGNIFICANTLY MORE COMPLICATED. LIKE THE TERMINAL / ENROUTE UNITS IT REQUIRES INTERFACE TO A CDI. THIS INTERFACE IS MORE COMPLEX. IT IS REQUIRED THAT THE OBS BE INTERFACED. ADDITIONAL ANNUNCIATORS AND SWITCHING ARE ALSO REQUIRED. THE FLIGHT MANUAL SUPPLEMENT IS MORE COMPLICATED. THE FLIGHT CHECK IS MORE COMPLICATED. IN ADDITION, SPECIFIC PILOT TRAINING WILL ALSO BE ABSOLUTELY NECESSARY.

THE GARMIN GPS-155 IS CURRENTLY THE ONLY ONE AVAILABLE WITH NPA APPROVAL. BENDIX KING IS NOW TAKING ORDERS FOR THE KLN-90B AND RECENTLY ANNOUNCED THAT THE FIRST SHIPMENTS WILL BE IN JANUARY 95. TRIMBLE FEELS THAT THERE UNIT WILL BE READY IN EARLY 95. NORTHSTAR STATES THAT THEY ARE REALISTICALLY 1 YEAR AWAY. THESE UNITS ALSO MUST BE QUOTED WITH SPECIFICS TO YOUR AIRCRAFT.

SOME OTHER FREQUENT QUESTIONS: " SHOULD I BUY NOW OR SHOULD I WAIT FOR THE NEXT LINE OF TECHNOLOGY ? " THE ONLY CHANGE COMING UP WILL BE PRECISION APPROACH. THIS IS AT LEAST 2 YEARS AWAY. THE FAA HAS NOT YET PUBLISHED TSO REQUIREMENTS. THE FAA HAS RECENTLY AWARDED A CONTRACT FOR THE DEVELOPMENT AND INSTALLATION OF 6 GROUND BASED DIFFERENTIAL GPS STATIONS TO BE COMPLETED IN LATE 1996. THESE WILL BE THE FIRST STEP TOWARDS DEVELOPING PRECISION APPROACH GPS.

" ARE THE PRICES GOING TO COME DOWN IN 6 MONTHS ?" WE DO NOT THINK SO. THE MANUFACTURERS HAVE GONE THROUGH A GREAT DEAL OF EXPENSE IN THE RESEARCH AND DEVELOPMENT, TESTING AND CERTIFICATION OF THE SYSTEMS. MANY OF THE PLAYERS IN THE MARKET PLACE HAVE NOT YET DEVELOPED APPROVED SYSTEMS. BY THE TIME THEY DO, THEIR EXPENSES WILL ALSO BE HIGH. WE DO NOT EXPECT ANY MAJOR PRICE REDUCTIONS. FOR AT LEAST 18 MONTHS TO 2 YEARS. AT THAT POINT, NON-PRECISION APPROACH UNITS WILL BE JUST AROUND THE CORNER. WE MAY SEE SOME FORM OF REBATE COUPON PROGRAM ABOUT 8 MONTHS FROM NOW. THIS WILL ONLY BE A TOKEN \$ 100 OR \$ 200 OFF.

THERE IS ONLY ONE UNKNOWN FACTOR IN IFR GPS INSTALLATIONS. THERE ARE 6 COM FREQUENCIES THAT ARE HARMONICS OF THE GPS FREQUENCIES. WHAT THIS MEANS IS THAT WHEN YOU TRANSMIT ON ANY OF THIS FREQUENCIES, IT CAN BLOCK THE GPS SIGNALS. THIS CAN CAUSE TEMPORARY LOSS OF GPS NAVIGATION. THIS SEEMS TO BE A RANDOM OCCURRENCE. THE FAA IS TRYING TO DECIDE IF IT WOULD BE POSSIBLE TO DESIGNATE THESE FREQUENCIES FOR GROUND OR RECEIVE USE ONLY ( ATIS, ETC.) HOWEVER, THAT SOLUTION IS TOO SIMPLE FOR THEM AND WOULD MAKE TO MUCH SENSE !

IT SHOULD ALSO BE STATED THAT IFR CERTIFIED GPS SYSTEM INSTALLATIONS SHOULD ONLY BE DONE BY QUALIFIED AVIONICS REPAIR STATIONS. THE INTERFACES REQUIRED ARE COMPLEX. IMPROPER INSTALLATION CAN CAUSE PROBLEMS WITH THE NEW GPS AS WELL AS WITH THE EXISTING EQUIPMENT.

I COULD PROBABLY WRITE MORE ABOUT THIS SUBJECT BUT, THIS IS ENOUGH FOR NOW.

***GPS - NOW IS THE TIME*** IF YOU ARE AN ACTIVE PILOT. GO FOR THE GOLD AND BUY AN IFR SYSTEM THAT YOU WILL BE SATISFIED WITH.

IF YOU WISH TO RECEIVE A QUOTE FOR AN INSTALLATION PLEASE STOP BY WITH YOUR "BABY" SO WE CAN HAVE A LOOK AT THE AIRCRAFT AND PREPARE A QUOTATION.