



# Fist of the Fleet Association

a non profit 501 (c) (19) military organization

## NEWSLETTER

October 2019

Preserving the Past Providing for Today

Promoting the Future

### AUTUMN EDITION

By: Jerry "Ricochet" Fritze

Apparently no one informed the weather that's it's still Autumn. It snowed here on the 28<sup>th</sup>/29<sup>th</sup>, and is supposed to snow again on the 31<sup>st</sup>. Typically in early November we would have a brief "Indian Summer" with temps in the low to mid-50's. Nah. Not gonna happen. It's supposed to be 41 today, and that's it until next Spring. So much for easing in to Winter.

If you haven't heard the news *Lincoln* has been extended. Not due to any of the current conflicts or crises. No, it's because *Truman*, the boat scheduled to relieve her isn't ready to deploy. It should be a matter of weeks, however, and then *Lincoln* can transit the I.O. and begin the long journey east eventually reaching her new homeport of San Diego. In other news the Blues are looking for a few good men. The Navy posted a call for petty officers (E5 and E6) experienced with maintaining the F/A-18E/F Super Hornets. The Navy has open billets for individuals with the aviation machinist's mate, aviation electrician's mate, aviation electronics technician and aircrew survival equipmentman ratings, according to a NAVADMIN posted earlier this summer. The Blues are expected to complete the transition to the "Super Hornets" by the end of 2021.

The mess that is the *Ford* put back to sea for more trials after more that a year of repairs. EMALS still isn't capable of launching an aircraft with external fuel stores, and additionally can only conduct 400 launches between critical failures which is far below the requirement spec of 4,166 take-offs. Another toy, the *Advanced Weapons Elevators* are giving the techs fits. Only 3 of the 11 work. The AWEs use high-powered permanent magnets that are computer-controlled but apparently the elevators don't line up with the hatches as they pass through the decks. What? Remember, this is the nation that went to the moon using slide rules. And I'm sorry, but what was wrong with wire-stranded cables and a good, old-fashioned analog UP and DOWN switch? Just not sexy enough? And there are still problems with the *Advanced Arresting Gear*. AAGs failed in 10 out of 760 attempts where the mean-cycle requirement is 16,500 attempts before failure. *Ford* was procured in FY2008. It is *expected* that she will be ready by 2024 for her first deployment, a huge push from her original date on 2018. That's in the same time frame that the Chinese are expected to have the first of their home-grown Type 002 carriers deployed. And Tokyo is considering modifying two of it's Izumo-class helicopter carriers to support F-35B Lightning II stealth fighters. (Yeah, I know. Who didn't see *that* coming).

But on a positive note the Navy's Super Hornet fleet is routinely 63 to 75 percent mission capable and should soon achieve an 80% reliability rate which they plan and hope to be able to sustain. Now, if only we have the ships to fly them off of.

The **FIST OF THE FLEET ASSOCIATION NEWSLETTER**: Trying to scare the every October since 2010!



out of you

~Later!~



[www.fistofthefleet.org](http://www.fistofthefleet.org)

#### Mission Statement

Perpetuate the history of Naval Aviation Squadrons VT-17, VA-6B, VA-65, VA-25 and VFA-25,

Remember deceased veterans and comfort their survivors,

Conduct charitable and educational programs,

Foster and participate in activities of patriotic nature,

Assist current active squadron members, and

Provide assistance to family members in times of emergency.

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## PRESIDENT'S MESSAGE

Summer is over, fall and football are in the air, Tailhook and Oshkosh are behind us and planning has begun for the *Fist '20 Reunion*. That's right, **the *Fist '20 Reunion* will be held September 10-13, 2020 in conjunction with Tailhook 2020 in Reno, NV at the The Nugget Casino and Hotel.** The dates are fixed so go ahead and mark your calendar. We will work to obtain a block of rooms, a hospitality suite, some interesting tours and activities for the wives while keeping the cost as low as possible. And of course, our squadron, VFA-25, will be back from deployment and we look forward to spending time with them.

Here are this edition's "Stump the Aviators" questions for your enjoyment.

- 1.) True or False, The first nonstop flight across the United States occurred before the first nonstop flight across the Atlantic Ocean.
- 2.) Flat-hatting is a military term to describe dangerous and unnecessary low level flying for a thrill. How did the term originate?
- 3.) Westinghouse developed the chicken gun in 1943. What is it and what is it used for?

Meanwhile, your Fist Association was involved with a great event honoring Capt John "Nick" Nicholson, CDR Everett Alvarez, Jr. and CDR Ron Boch who were once again together for the first time since their flights in 1964 with VA-144 in what became known as the Gulf of Tonkin Incident on August 4-5, 1964. With Al "Mr. Big" Gorthy and Gary "Dome" Kerans taking the organizational lead to put the event together, our association stepped up to co-sponsor the event which was held at NAS Lemoore. A great article with photos follows in the newsletter for more details. Bravo Zulu to "Mr. Big" and "Dome". Some of you may recall that Capt. Nicholson was the C.O. of USS Ranger (CV-61) during our Westpac cruise in 1976.

And the answers to "Stump the Aviators" follow:

- 1.) False, John Alcock and Arthur Brown made the first nonstop crossing of the Atlantic in 1919. Not until 1923 did US Army pilots Oakley Kelly and John Macready make the first nonstop crossing of the United States.
- 2.) Straight from an official US Navy publication, the expression arose from an incident during which the wheel of a low flying airplane struck a pedestrian on the head and crushed his top hat.

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3.) The Westinghouse chicken gun was a compressed air cannon used to shoot chicken carcasses at the windshields and leading edges of high-speed aircraft to test their ability to endure bird strikes. The carcasses must not be frozen, as was the case when the LearJet was tested during FAA certification.

See you at the ***Fist '20 Reunion***.

John "Chalks" Chalker

President



### Blues Tour Dates

Nov 2/3 Thunder Over South Georgia Moody AFB GA  
Nov 8/9 Blue Angels Homecoming Airshow NAS Pensacola FL

## SKIPPER'S CORNER

Fist of the Fleet pilots take to the skies over the Arabian Sea supporting United States Central Command strategic objectives. Whether deterring Iranian aggression, maintaining freedom of the seas, or supporting ground commanders in Afghanistan, our team stays vigilant on the watch. Unfortunately, the uncertainty in the region combined with the offensive strike power of this aircraft carrier has manifested in an extension in this area of operation. This critical mission combined with the added time away from home can be stressful for our Sailors; but rest assured we are performing that mission effectively and professionally. I would be remiss not to thank our loved ones at home who deserve enormous credit for their sacrifices and patience as we now remain on station longer than expected. Our Navy's secret weapon truly is the resiliency of the families we say farewell to when we deploy.



With continued peak performance, the Sailors of the Fist of the Fleet never cease to amaze me with their level of commitment to making this great organization even better. Recent accomplishments have come in threes to include minting three new Navy Chiefs, qualifying three Strike Fighter Weapons and Tactics combat section leads, and winning Air Wing SEVEN's TOP HOOK for the third consecutive time. Additionally, the command celebrated a momentous achievement by flying the Enlisted Aviation Warfare Pennant, indicating that seventy-five percent of our Sailors have earned their wings.

The Fist of the Fleet team leads the air wing both in tactical acumen in the sky, and full combat system aircraft ready for mission tasking. Never before have these magnificent chariots we fly been in better condition. I challenged the squadron to keep this momentum and finish the deployment stronger than we started. As an avid football fan, I related the end of this deployment to playing in the big game. We're in the fourth quarter now. The game is still on the line. We will not let up until victory is ours.

CDR David Dartez

Commanding Officer VFA-25

**FROM THE COCKPIT:** By: LT Wes "Trash Blast'er" Perkins

The Fist of the Fleet is currently in its seventh month of their 2019 combat deployment. While 'groundhog day' continues, we still find ways to keep things interesting and exciting here in 5<sup>th</sup> Fleet. One such occasion occurred on a recent mission in support of Operation Rabid Badger (ORB) in Afghanistan. Myself and LT Marvin "ICE-P" Chen, both of us having just completed our Combat Section Lead qualification, were given the opportunity to take part in a pre-planned strike against targets in ISIS controlled territory. The flight would cover roughly 2500 miles of travel, consist of a number of lengthy aerial refueling (AR) evolutions, require quite a bit of coordination and cooperation between the other air wing squadrons, and be conducted entirely during a moonless night. A rewarding flight for my first official combat section lead.



The brief for our flight was similar to prior Afghanistan mission briefs. While this wasn't my first lead 'in country', it was the first time I would be leading another first tour JO. To further the excitement, we were almost guaranteed to employ ordnance – a highlight for any strike fighter aviator. Needless to say, we briefed our target packs, and reviewed intel assessments. With Skipper and XO trusting two of their newest JO's together in country, we wanted to make the Fists proud and execute like the professionals we are. Of course with launch just prior to sunset, and the brief being at 0800, we both crushed a 'tactical' nap in preparation for the seven-hour mission.

The launch went exactly as expected. Considerably out of order, and late. I was first off the deck, with ICE-P launching last for unknown reasons. Initially I held overhead, until I calculated I had to start pushing north. I changed our rendezvous plan real time for fuel considerations and timing to our first in country AR. Ultimately we got the flight together almost one-hundred miles north as we approached the boulevard. Level at our transit altitude we checked the system status of our two substantial weapons; 2000 pound JDAMs. Their weight and drag was noticeable on the F/A-18, but a small price to pay for something that would make such a big explosion.

On our transit to the target area we met our tanker for the drag north. Luckily, all KC-10's this evening. Popular among us Naval Aviators, the KC-10 is typically welcome relief due the ease of tanking compared to the KC-135. In addition to our two aircraft, there was another section of F/A-18's consisting entirely of JO's from VFA-103 and VFA-86 who were on similar missions. The tanker drag was uneventful, albeit slow from the KC-10. Once AR complete we began our check-in process with the Joint Terminal Attack Controller (JTAC), with the other section shortly behind.

This was the second day of the pre-planned missions. The area we were striking was in close proximity to the Himalayas, yielding many communication blind zones in the mountainous terrain. To make matters more frustrating, I was having difficulty receiving the JTAC's transmissions due to aircraft radio issues that began during the transit. Ultimately, I was able to coordinate with the JTAC by passing word through my wingman.

We were given permission to climb to the top of the stack where communications improved slightly and the attacks could begin. Our particular set of targets were near the Afghanistan border, requiring extra care to avoid flight into Pakistan. The JTAC was very savvy with the near border OPS, and coordination was seamless.

After identifying our targets and checking our weapons status, we called, "strike posture set", awaiting the authority for weapons release. Needless to say, even with the frustration from radio challenges, myself and ICE-P were very excited. Finally, we were told to push. I directed the flight to bring the throttles forward, and I gave a flow heading to point us toward the target on our run-in heading. We passed an "in" call to the JTAC, and immediately were told to abort the run. My heart sank briefly as I thought our strike would be cancelled, as we were minutes from needing to depart to make it back to the boat prior to the deck closing. Turns out a truck had driven too close to our targets, preventing us from employing. Still spring loaded and ready to try again, we returned to our holding location while the other section began executing their run. I was growing increasingly concerned and jealous that the Fist's would end us sitting on the sidelines during this important mission.

Finally, moments later our targets had cleared. I directed an immediate push. ICE-P called "in" for the flight, and we both received the mandatory "cleared hot". I cannot describe how exciting it was feeling the thump as 4000 pounds of ordnance released from my aircraft. Our tapes recorded our excitement, which increased tenfold once the weapons impacted. "Good hits! Ground Commander's intent met." I'd heard this many times in training, and always thought it kind of goofy sounding. Not the case on this day. We were overjoyed knowing we had done our part. The explosions were massive - it was an awesome sight! However, we still had to travel three hours back to the ship; and we were now very late and low on fuel.

Honestly, the strike was one of the easiest parts of the flight. Rendezvousing back with the tanker, and coordinating the drag for ourselves and sister squadron would prove to be a fun challenge for us JO's. As a result of the long delay trying to achieve appropriate two-way communication, both sections loitered in the target area longer than anticipated. This meant not only did we need to coordinate with the tanker to wait for us (they also needed to leave), we would need to pass word to the boat that the strikers would be returning late. Ultimately this became a cooperate-to-graduate endeavor.

As we cycled all four Rhino's through the KC-10, we ran fuel ladders and compared numbers among each other to know exactly when we could depart the tanker in order to speed up. The deck would be closing for the end of a fourteen-hour fly window, and the tanker only had a finite amount of give remaining. Luckily our jets weren't quite as draggy now that we got rid of the bombs. We figured out exactly how much gas we needed to be able to depart the tanker and head home faster. Coordination with the boat through resources in Afghanistan was surprisingly easy on this occasion. They were ready for our later than expected arrival, and all four of us re-hacked our night trap currency a little past midnight.

Being chosen for this flight will forever be a highlight of my naval career. Throughout the entire deployment, I've been eager to employ ordnance in support of our mission. Don't get me wrong, I love getting a BFM hack out, doing some flybys, ripping off a \$hit Hot break, or even just burning some holes in the sky. But to drop two 2000 pound JDAMS on an ISIS supply road, using the jet as the war machine it was designed to be, really does make me DAMN PROUD!

## **FROM THE HANGER DECK:**

Fist of the Fleet, I am AZ3 Larios. Born in Long Beach, California, raised in Omaha, Nebraska from age 11. After high school, I attended the University of Nebraska at Omaha to work towards a Bachelor's Degree in Criminal Justice. I joined the Navy at age 23 to refine my resume and finish paying for my education. I got married September 2018 to my wife Kalie from my hometown whom I met in the Fresno area during my first year in VFA-25.

I came to VFA-25 as an Undesignated Airman in 2016. Now I work in Maintenance Control alongside our Chiefs and supply team. I spend most of the day shadowing my superiors while also asking questions to expand my knowledge of the AZ rating. My job is mainly managing logs and records for Fist of the Fleet aircraft and any associated materials in support of our ten beautiful F/A-18E aircraft. I also assist in the troubleshooting of OOMA, as well as assist work centers with maneuvering their maintenance records both digitally, and on paper. During the flight schedule I assist the pilots, and maintenance control Chiefs by downloading flight data from the maintenance cards which is used to determine status of the aircraft. I am hoping to become a Second Class Petty Officer on this next exam, something I believe I can achieve after a load of training from AZC Viramontes, AZ1 Newell, AZ2 Conner, AZ2 McCaslin, and AZ3 Diaz.

Through my experience at VFA-25 I have learned to become more resilient, composed, patient, disciplined and ambitious. VFA-25 has taught me that we can succeed even when times are tough. When the going gets tough, the Fist keeps going. At times we bash heads with each other, but at the end of the day the Fists come together to complete the mission. It is safe to say that VFA-25 has had a huge role in helping me advance as a professional, and as a person. I plan on doing my job as a Fist until my very last day. Viva la Fist!



**Have you paid your 2019 Dues?**

**Annual Dues: \$25/YR**

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**FIST FALL PICS**



## DID YOU KNOW: NAVY, MILITARY AND OTHER INFORMATION

### Gulf of Tonkin Incident Reunion

On September 16-17 Strike Fighter Wing Pacific and NAS Lemoore hosted the reunion of three former NASL shipmates that took part in what became known as the Gulf of Tonkin Incident back in August 4-5, 1964. Capt John “Nick” Nicholson, CDR Everett Alvarez, Jr. and CDR Ron Boch were once again together for the first time since their flights in 1964 with VA-144. The gathering was both an emotional and inspiring event to witness. FOFA was honored to sponsor part of the festivities along with a very generous donation from the Lemoore/Hanford chapter of ANA and our anonymous benefactor at the Vineyard Restaurant in Lemoore.

An informal dinner took place Monday evening with numerous sea-stories and heartfelt exchanges. Early Tuesday we were off to the NASL Aviator Memorial and then on to Porterville for the dedication of an A-4 at the airport honoring CDR Alvarez and VA-144. Then back to NAS and a wonderful tour of VFA-125 and the F-35 and VFA-122 and the F/A-18. After lunch at the Ops Galley we were back at Mainside and a wreath dedication at the NAS A-4 honoring all who served in Skyhawks in combat in Vietnam. The main program was held at the Base Theatre with presentations from our NASL hosts and our three great honorees. The many guests and former shipmates then retired to the Oasis Club for refreshments and conversation. Thanks to the several former Fist’s who made the effort to attend. It was great seeing you all and sharing this event with you.

In summary, we know this reunion meant a great deal to Nick, Everett and Ron, but it was also significant to all those who either served with or knew any of these fine men who influenced their own careers.

Top: Everett at A-4 dedication in Porterville with the color guard and many CPO’s that got it repainted for the dedication

Bottom: Nick, Everett and Ron at the NASL Aviators Memorial

Meet the First Finnish Pilot to Land on an US Aircraft Carrier by: Robert Beckhusen, The National Interest 10/09/219



It is not often that another country lands one of its planes on a US carrier. Capt. Juha “Stallion” Jarvinen’s landing was the first landing on an aircraft carrier by a Finnish air force pilot in history, according to the Navy. Jarvinen was flying a US Marine F/A-18C Hornet with Marine Fighter Attack Training Squadron 101 as part of a pilot exchange program — also a first between the US Marines and the Finnish air force. “It was pretty intense,” Jarvinen said according to a Navy [news release](#). “I was extremely happy because I knew I actually caught the wire when I felt the sensation of rapidly slowing down, but at the same time I was a little disappointed because I caught the second wire and not the third.”

Nimitz-class aircraft carriers — with two exceptions, the *Ronald Reagan* and *George H.W. Bush* — have four arresting wires, or cables. Catching the third cable is safest, but the snagging the second one isn’t bad. The landing is interesting because Finland, like neighboring Sweden, is an officially neutral country and is not part of NATO, and the country during most of the post-war era navigated a fine line between East and West. That is still true, mostly. “At the moment, to have Finland and Sweden forming this militarily non-aligned zone, I think that increases the security and stability in the Baltic Sea region ... I see no reason to change this,” Finland’s center-right Prime Minister Juha Sipila told Reuters in Dec 2017.

However, in recent years Finland’s military has participated in more joint military exercises with NATO countries — the first pilot exchange program with the US Marines being a case in point. Finland is making plans for a large-scale joint exercise in Finnish territory with Sweden and the United States as early as 2020. The model is the Aurora 17 exercises in Sept 2017 — one of Sweden’s biggest military drills in decades, and included troops from 10 countries including the United States and Finland. These events are on top of NATO exercises in the Baltic states, and a new US Marine rotation in Norway and the basing of Swedish troops to the island of Gotland.

“The need for similar kinds of exercises in Finland is obvious, especially when you consider that new legislation came into effect last summer on the obligation of the Finnish Defense Forces to receive and provide international assistance. Finland should have opportunities to practice receipt of this international assistance,” Finnish Defense Minister Jussi Niinistö said.



## GREEN TAILS OVER 'NAM: OPERATION LINEBACKER II - THE AIR DEFENSES PART 1: AAA

The **ZU-23** Anti-Aircraft Artillery Gun was developed in 1957 by the Soviet Union. The 2A14 gun was developed for 1957. The ZU-23 consists of twin 2A14 Guns, light carriage mount based on two wheel chassis, ZAP-23 automatic anti-aircraft sight, and additional sight used to fire at the ground targets.

The 2A14 Gun is based on the 23-mm rapid fire aviation gun and consists of a rifled 87.3 caliber length barrel, barrel box, lock's frame, lock, and also from feeding, hammer, and returning mechanisms. The returning mechanisms are based on the usage of powder gas from the barrel's channel through the barrel's walls. Two guns are mounted on the upper mount carriage. Left and right barrels are identical except the feeding mechanism position. It uses belt feeding from the ammunition boxes. Each gun's rate of fire is 1000 rounds per minute. It defeats targets in 2.5 km range and in 2 km altitude. Projectile initial speed is 970 m/s.



The **ZPU** is a family of towed anti-aircraft gun based on the Soviet 14.5×114mm KPV heavy machine gun. It entered service with the Soviet Union in 1949 and is used by over 50 countries worldwide. Quadruple (**ZPU-4**), double- (**-2**) and single-barreled (**-1**) versions of the weapon exist. Development of the **-2** and **-4** began in 1945, with development of the **-1** starting in 1947. All three were accepted into service in 1949. Improved optical predicting gunsights were developed for the system in the 1950s.

All weapons in the ZPU series have air-cooled quick-change barrels and can fire a variety of ammunition. Each barrel has a maximum rate of fire of around 600 rounds per minute, though this is practically limited to about 150 rounds per minute. The quad-barrel ZPU-4 uses a four-wheeled carriage similar to that once used by the obsolete 25 mm automatic anti-aircraft gun M1940. In firing position, the weapon is lowered onto firing jacks. It can be brought in and out of action in about 15 to 20 seconds, and can be fired with the wheels in the traveling position if needed. The double-barrel **-2** was built in two different versions; the early model has large mud guards and two wheels that are removed in the firing position, and the late model has wheels that fold and are raised from the ground in the firing position. The single-barrel **-1** is carried on a two-wheeled carriage and can be broken down into several 80-kilogram pieces for transport over rough ground.

The **Shilka ZSU-23-4** is a Self-Propelled Anti-Aircraft Gun featuring a prominent radar dish that can be folded down mounted on a modified PT-76 chassis. The *Shilka* is capable of acquiring, tracking and engaging low-flying aircraft (as well as mobile ground targets while either in place or on the move). Employed in pairs 200 meters apart, 400 meters behind battalion leading elements, it is commonly used to suppress ATGM launch sites, such as TOW vehicles. The armament consists of four 23mm cannon with a maximum slant range of 3,000 meters. Ammunition is normally loaded with a ratio of three HE rounds to one AP round. Resupply vehicles carry an estimated additional 3,000 rounds for each of the four ZSUs in a typical battery. Recent information details ZSU-23-4 updates/modernization being offered by the Ukrainians that include: a new radar system replacing the GUN DISH radar, plus a sensor pod believed to include day/night camera, and a laser rangefinder; and mounted above radar/sensor pod is a layer of six fire-and-forget SAMs, believed to be Russian SA-18/GROUSE.



ZSU with Gun Dish deployed

The *Shilka* a fully integrated, self-propelled antiaircraft system with four liquid-cooled 23-mm automatic cannons mounted on the front of a large, flat, armored turret. The chassis has many components borrowed from other Soviet armored vehicles, and the suspension system resembles that of the PT-76 and ASU 85 (six road wheels and no track support rollers). The driver sits in the left front of the hull, and the rest of the crew (commander, gunner, and radar operator) are located in the turret. The GUN DISH fire control radar mounted on the rear of the turret can be folded down during travel.

The **RPK-2 GUN DISH** radar operates in the J band and can detect aircraft up to 20 km away. It has excellent target tracking capability and is relatively hard to detect by the enemy. However, the radar picks up many false returns (ground clutter) under 60 m of altitude. The radar antenna is mounted on collapsible supports in the top rear of the turret. There is an optical alignment sight. The radar proved to have good protection against enemy passive electronic radar counter-measures. Nevertheless, the radar system of the ZSU-23-4 has a short detection range during target search, depending on weather conditions. It is hard to automatically track the target at ranges less than 7–8 km because of the high angular speed of the target at close distances. The radar needs to be reset quite often because of the unstable parameters of electronic cathode-ray tubes of the target selection system. The absence of an automatic laser range finder requires a skillful commander and gunner



The **M1939** is a Russian-made 37mm anti-aircraft gun which was developed during the late 1930s and used during WWII. The M1939 is operated by a crew of eight soldiers. The effectiveness of the 37-mm automatic anti-aircraft gun M1939 against modern aircraft is very limited and it has no poor weather or all-weather capability. It is not limited for anti-air defense but could be also used as anti-tank gun system. The M1939 is no longer in service with the Russian armed but many countries in Middle East and Africa still use this type of anti-aircraft gun.

The gun uses a single barrel 37mm cannon. A total of 200 rounds of ammunition were carried which were fed into the gun in five round clips. Armour penetration of the armor-piercing rounds is reported as 37 millimeters of rolled homogeneous armor at 60° at 500 meters range and 28 millimeters of RHA at 90° at 1500 meters range. The M1939 can fire

FRAG, AP, HVAP or HE ammunitions.

The 37mm gun is installed on a four wheeled carriage. In the firing position the wheels are raised off the ground and it is supported by four screw jacks, one at the front, one at the rear of the carriage and one either side on outriggers. When traveling, the barrel is pointed to the rear and is held in position by a lock hinged at the rear of the carriage. Basically a shield is mounted to each side front of the gun but most countries have removed the shield.

The M1939 is towed most of the time by a military truck or light tactical vehicle as the GAZ-63. The gun has an effective slant range of 2,499 m. Effective altitude limit with an elevation of +45° is 1,768 m and with an elevation of +65° is 2,865 m.

The **KS-12** of 85mm caliber is a Russian-made towed anti-aircraft gun introduced with the Soviet army in 1939. The KS-12 has the capability to engage all manner of ground attack aircraft and drive bombers to heights where their bombing would be far less accurate. Large numbers of KS-12 guns were used by the North Vietnamese forces during the Vietnam war. The KS-12 85mm remains in service with over a dozen armed forces around the world, many of whom keep it in active front line service. The KS-12 can be used against ground targets with a maximum range of around 8 km. It is manually loaded and traverse and elevation are manual as well, resulting in a crew of 7. The weapon system consisted of a 85mm caliber main gun with a large multi-baffle muzzle brake mounted on a four wheeled trailer. The 85mm cannon is mounted on a turntable which can rotate on 360° with an elevation of +82°/-3°. The KS-12 can fire 85mm FRAG against aircraft and AP rounds against armored vehicles.

The 85mm cannon is mounted to four wheeled carriage with two axles, one at the front and one at the rear. In traveling position, the mount together with 85-mm ordnance is traversed to the rear and the ordnance is held in position by a traveling lock at the rear of the carriage. In the firing position the carriage is supported on four screw jacks, one at either end of the carriage and one either side on outriggers. An armor shield can be mounted at the front each side of the 85mm cannon. The weapon system is fitted with fire control equipment which can be used in conjunction with the PUAZO-6/12 director and the SON-9/SO-9A (NATO 'Fire Can') A/B-band fire-control radar. The effective slant range of the 85mm M1939 is 8,382 m. Effective altitude limit with an elevation of +45° is 5,944 m. Effective altitude limit with an elevation of +65° is 7,620 m.



Fire Can radar



The **KS-19** 100mm air defense gun was a Soviet anti-aircraft gun. Following the end of WWII the Soviet Union introduced into service the 100 mm KS-19 and 130 mm KS-30. It is a heavy towed anti aircraft gun that has largely disappeared from front line arsenals due to increased use of more effective surface-to-air missiles. Being a towed weapon an external form of mobility was required, usually an AT-S Medium or AT-T Heavy tracked artillery tractor. The 15 man crew were carried on the tractor along with ready use ammunition for the gun. Ammunition was loaded as a single round into the loading tray and a well trained crew could fire 15 rounds maximum per minute.

Anti-Aircraft ammunition includes high explosive, high explosive fragmentation and fragmentation types. The KS-19's onboard sights can be used to engage air targets; however increased accuracy was achieved if used in conjunction with a fire control radar such as the SON 9 (NATO 'Fire Can') and PUAZO-6/19 director. As the KS-19 is a heavy caliber Anti-Aircraft gun it also has some utility in the ground role especially against armored targets. As a result of this two armor piecing rounds were produced: the AP-T (Armour Piercing-Tracer) and APC-T (Armour Piercing Capped-Tracer) with the AP-T round reportedly able to penetrate 185 mm of armor at 1000 m. The KS-19 was used in action by communist forces in both Korea and Vietnam. Recently Iran has built an upgraded automatic version of KS-19 named Sa'i

Source: wikipedia

## **NEXT TIME IN FISTORY: GREEN TAILS OVER 'NAM: THE AIR DEFENSES PART 2 - SA-2 GUIDELINE**