

THE NATIONAL RECONNAISSANCE OFFICE PRESENTS:

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AUTHORITY



SUPRA ET ULTRA

1



NR THE STORY

**AMAZING
TECHNOLOGY!**

**HISTORY
MAKING
MISSIONS!**

**DISCOVER THE INSIDE STORIES BEHIND
THE COLD WAR, THE SPACE RACE, AND
INTELLIGENCE GATHERING FROM ORBIT!**


NR THE STORY

HIGH ABOVE THE EARTH, AN AMAZINGLY SOPHISTICATED NETWORK OF SATELLITES ORBITS THE EARTH, MONITORING ADVERSARIES AND THREATS TO THE U.S., BOTH DAY AND NIGHT!



BY COLLECTING IMAGERY, COMMUNICATION SIGNALS AND OTHER DATA, THE U.S. WORKS TO REMAIN ONE STEP AHEAD OF ITS FOES. AND THE AGENCY RESPONSIBLE FOR THIS CUTTING EDGE TECHNOLOGY?

THE NATIONAL RECONNAISSANCE OFFICE, OR **NRO!**



IMAGERY REVEALS
EMERGING THREATS...



SIGNALS PROVIDE
VALUABLE INTELLIGENCE...

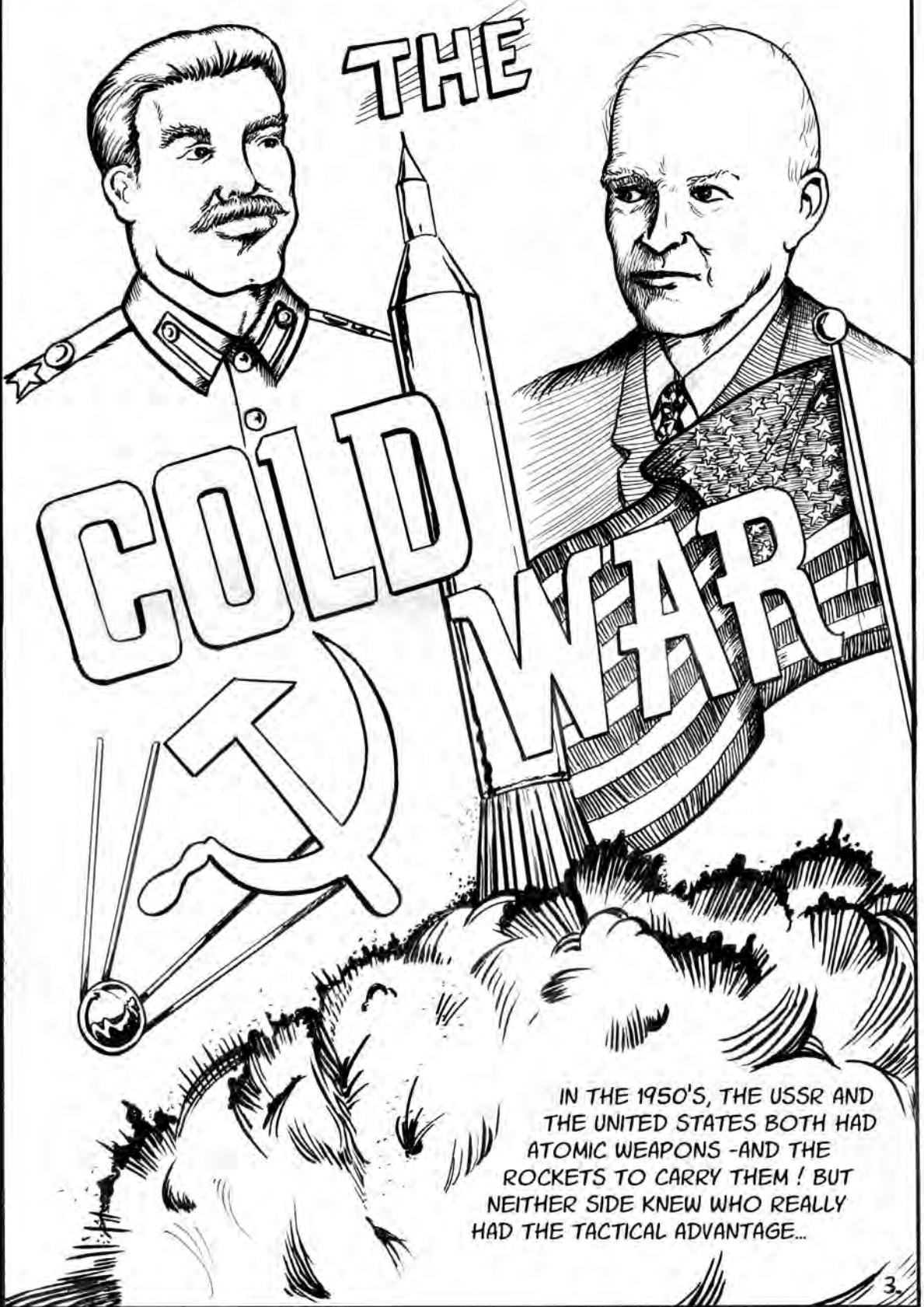


AS MILITARY AND CIVILIAN
OPERATORS WORK TOGETHER
TO KEEP THE U.S. ONE STEP
AHEAD OF OUR ADVERSARIES.

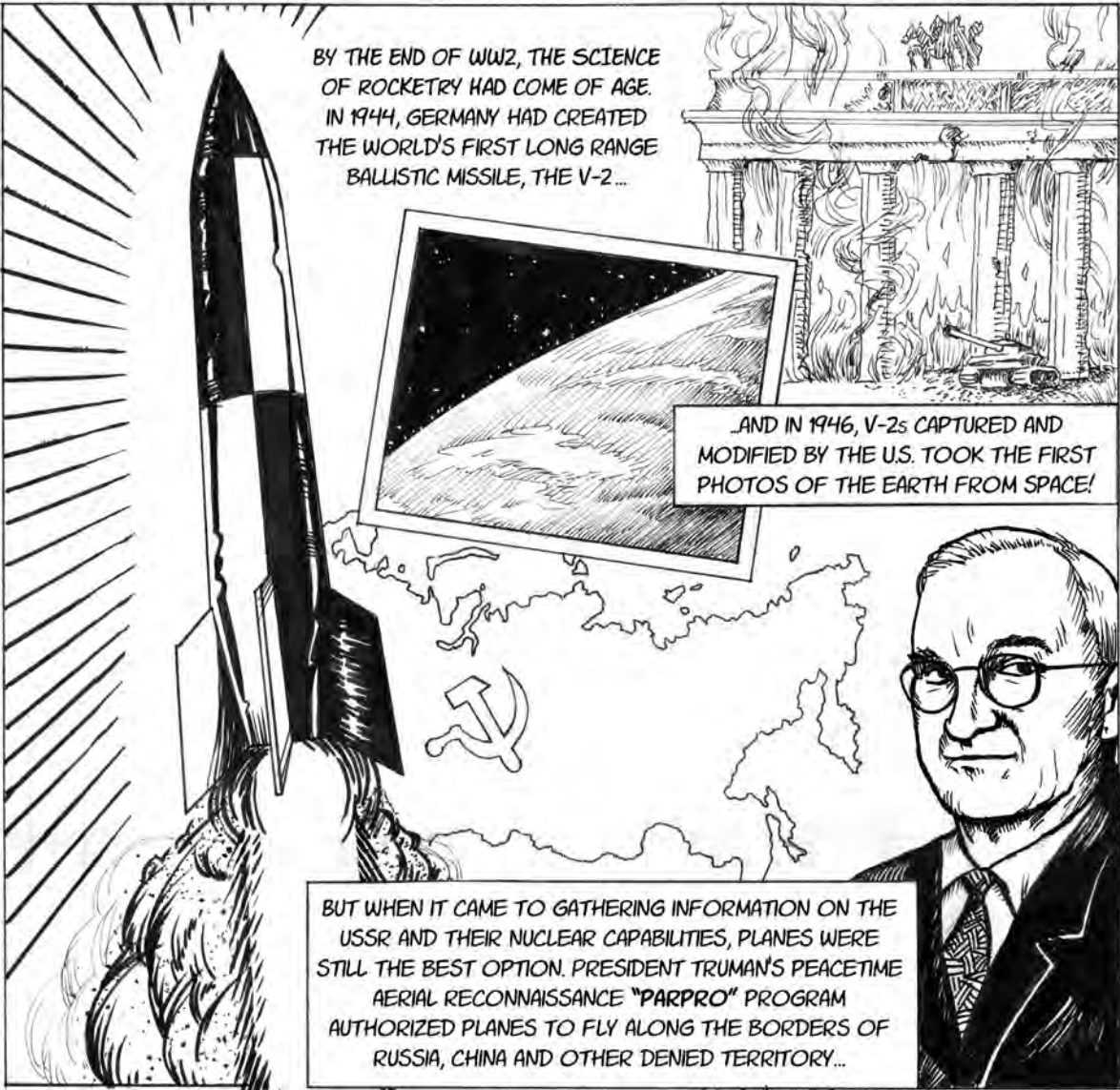


SO HOW DID THIS AMAZING
SURVEILLANCE FROM SPACE
COME TO BE?

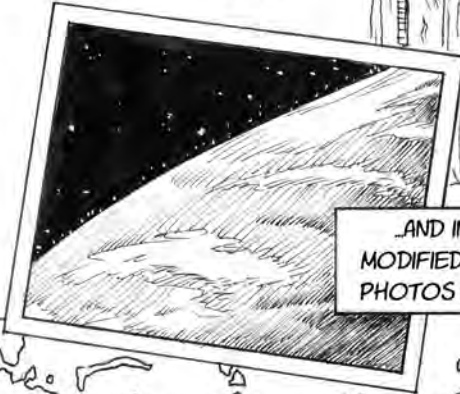
TO UNDERSTAND THE STORY OF THE NRO, YOU FIRST NEED TO UNDERSTAND...




IN THE 1950'S, THE USSR AND THE UNITED STATES BOTH HAD ATOMIC WEAPONS -AND THE ROCKETS TO CARRY THEM ! BUT NEITHER SIDE KNEW WHO REALLY HAD THE TACTICAL ADVANTAGE...



BY THE END OF WW2, THE SCIENCE OF ROCKETRY HAD COME OF AGE. IN 1944, GERMANY HAD CREATED THE WORLD'S FIRST LONG RANGE BALLISTIC MISSILE, THE V-2...



...AND IN 1946, V-2s CAPTURED AND MODIFIED BY THE U.S. TOOK THE FIRST PHOTOS OF THE EARTH FROM SPACE!



BUT WHEN IT CAME TO GATHERING INFORMATION ON THE USSR AND THEIR NUCLEAR CAPABILITIES, PLANES WERE STILL THE BEST OPTION. PRESIDENT TRUMAN'S PEACETIME AERIAL RECONNAISSANCE "PARPRO" PROGRAM AUTHORIZED PLANES TO FLY ALONG THE BORDERS OF RUSSIA, CHINA AND OTHER DENIED TERRITORY...



RUSSIAN MIGS!

THERE'S TOO MANY!



...IT WAS A DEADLY BUSINESS.

IN 1950, TRUMAN ESCALATED THE SURVEILLANCE, ALLOWING PLANES TO FLY DIRECTLY OVER DENIED TERRITORY.

IN 1953, NEWLY ELECTED PRESIDENT EISENHOWER LEARNED OF THE SPYPLANE MISSIONS... AND WAS NOT HAPPY.

SEC. OF STATE
JOHN FOSTER
DULLES

PRESIDENT EISENHOWER

CROSSING CHINA'S OR RUSSIA'S BORDERS...THAT'S NEARLY AN ACT OF WAR!

BLAST IT, THAT MAY REALLY BE AN ACT OF WAR!

IKE... THIS IS MORE THAN DOGFIGHTS NOW. THE NEXT PEARL HARBOR COULD BE NUCLEAR.

PERHAPS WE JUST NEED TO ENGINEER OUR PLANES TO FLY HIGHER...FASTER?

THE WELL-TRAINED ASTRONAUT CAN PERFORM HIS DUTIES, CONDUCT REPAIRS AND REPLACE VACUUM TUBES EVERY 24 HOURS.

AT THE TIME, SATELLITES EXISTED ONLY IN SCIENCE FICTION...AND TYPICALLY ASSUMED AN ON-BOARD ASTRONAUT!

ARTHUR C. CLARKE

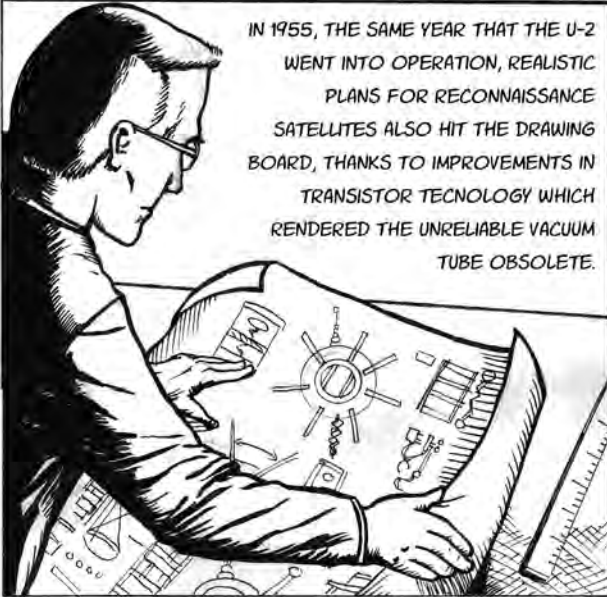
SO, WITH SATELLITES NOT YET POSSIBLE, THE UNITED STATES FOCUSED THEIR EFFORTS ON DEVELOPING HIGH-ALTITUDE PLANES. CLARENCE "KELLY" JOHNSON WAS CHIEF ENGINEER AT LOCKHEED'S CALIFORNIA FACTORY NICKNAMED THE "SKUNK WORKS"



SIR, MAY I PRESENT THE "U-2"? IM CONFIDENT IT WILL BE UNTOUCHABLE. OTHER PLANES MAX OUT AT 45,000 FEET ... BUT THE U-2 WILL REACH 70,000 FEET! MAYBE MORE!



IN 1955, THE SAME YEAR THAT THE U-2 WENT INTO OPERATION, REALISTIC PLANS FOR RECONNAISSANCE SATELLITES ALSO HIT THE DRAWING BOARD, THANKS TO IMPROVEMENTS IN TRANSISTOR TECHNOLOGY WHICH RENDERED THE UNRELIABLE VACUUM TUBE OBSOLETE.



IN THE MEANTIME, SPYPLANES REMAINED A PRIORITY.



I THINK IF WE PUT OUR HEADS TOGETHER WE CAN ENGINEER AIRBREATHING SPY PLANES THAT CAN FAR EXCEED MACH 2...EVEN EXCEED MACH 3!

MACH 3? 3 TIMES THE SPEED OF SOUND? IS THAT EVEN POSSIBLE?

YOU BET IT IS.



BUT ON OCTOBER 4TH, 1957, AN UNEXPECTED SOVIET LAUNCH SUDDENLY MADE SATELLITES AMERICA'S TOP PRIORITY!



SPUTNIK!

THE USSR INAUGURATED THE SPACE AGE WITH SPUTNIK'S SUCCESSFUL LAUNCH, TAKING THE WORLD BY SURPRISE! THE U.S. HAD PLANS FOR ITS OWN SATELLITE PROGRAM, AND HAD CONDUCTED NUMEROUS ROCKET TESTS WITH DIFFERING DEGREES OF SUCCESS. BUT THE GOVERNMENT WAS ANNOYED AT BEING ONE-UPPED BY THE USSR...YET SOMEHOW ALSO INDIFFERENT.



I'M CONCERNED THAT THE PUBLIC REACTION COULD GET OUT OF CONTROL...

WE'VE BEEN WORKING ON SATELLITES! AND THE SOVIETS BEAT US ANYWAY!

NO, NO, IT'S NOT A BIG DEAL. IT'S JUST A SIMPLE SATELLITE. REALLY JUST A SIGNAL REPEATER DEVICE.



HE'S RIGHT, IKE. PEOPLE AREN'T REALLY GOING TO CARE. LOOK AT WHAT WE'VE DONE FOR THE NATION'S HIGHWAYS!

I THINK THE AMERICAN PUBLIC REALIZES WE COULD HAVE BEATEN THE REDS INTO SPACE IF WE REALLY WANTED TO. THEY KNOW WE HAVE HIGHER PRIORITIES!

IT DOESN'T DO MUCH ON ORBIT!



AGREED. WE'VE GOT OTHER BIGGER CONCERNS. CAN WE GET BACK TO PLANNING NEXT MONTH'S NATO SUMMIT - ?

SPUTNIK IS JUST A HUNK OF IRON. PRETTY MUCH ANYONE COULD HAVE LAUNCHED.



HONEY...I THINK IT'S TIME YOU FINISHED THAT BOMB SHELTER!



BUT THEY HAD UNDERESTIMATED THE PUBLIC OUTCRY!

AMERICA ACTED QUICKLY, STEPPING UP EFFORTS ON THEIR SATELLITE PROGRAM, LED BY GERMAN SCIENTIST WERNHER VON BRAUN, AND AMERICAN SCIENTISTS JAMES VAN ALLEN AND WILLIAM PICKERING. JUST FOUR MONTHS LATER, THEY SUCCEEDED! EXPLORER 1 WAS SUCCESSFULLY LAUNCHED ON JANUARY 31, 1958!



A GEIGER COUNTER INCLUDED BY VAN ALLEN SHOWED THE EARTH WAS RINGED BY HIGHLY RADIOACTIVE BANDS, WHICH WERE SOON DUBBED "VAN ALLEN BELTS" IN HIS HONOR. THE U.S. WAS OFFICIALLY IN THE SPACE RACE - TO WIN IT!

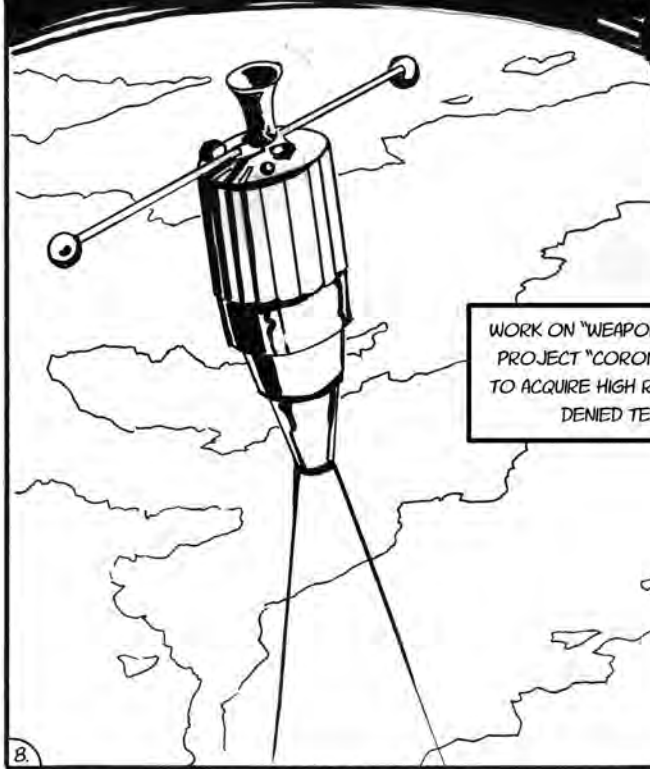
DESPITE A SERIES OF SOVIET FIRSTS, THE U.S. WAS DETERMINED TO BE THE FIRST TO CONDUCT RECONNAISSANCE FROM SPACE.



LAIKA, FIRST DOG IN SPACE
USSR, 1957

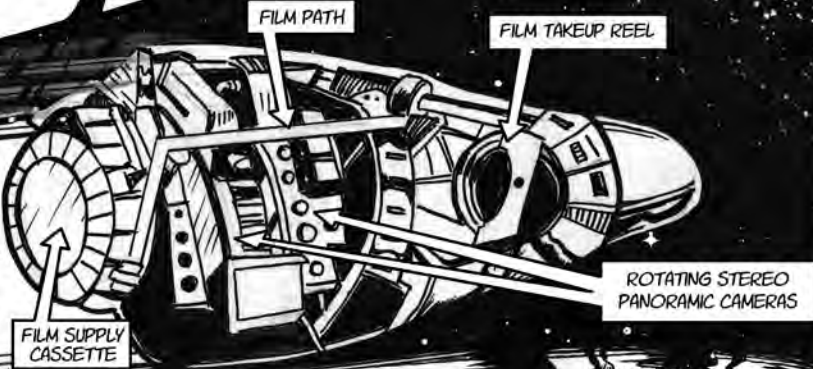
WORK ON "WEAPONS SYSTEM 117L," LATER CALLED PROJECT "CORONA," BEGAN IN 1954. THE GOAL? TO ACQUIRE HIGH RESOLUTION PHOTOGRAPHY OF DENIED TERRITORY FROM SPACE!

BY 1959, PROJECT CORONA HAD MADE SIGNIFICANT PROGRESS, BUT STILL HAD A NUMBER OF OBSTACLES TO OVERCOME... NOT THE LEAST OF WHICH - LAUNCH!

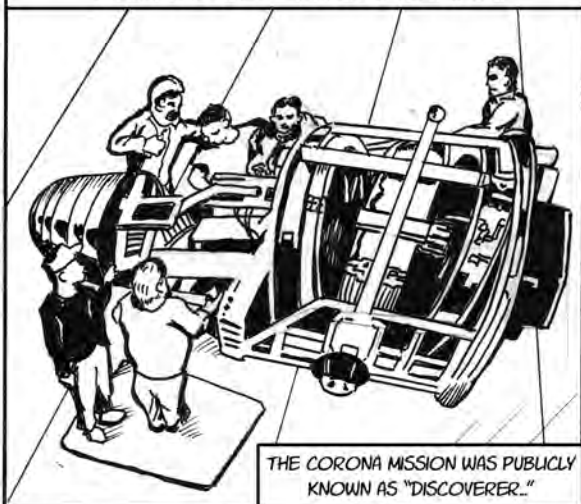


CORONA!

CORONA REPRESENTED THE BEST IMAGERY INTELLIGENCE, OR **IMINT** SATELLITE TECHNOLOGY THAT THE U.S. TOP ENGINEERS COULD PRODUCE. NOW IT WAS JUST A MATTER OF GETTING THE SATELLITE INTO SPACE - WHICH WAS EASIER SAID THAN DONE!



BUT EACH ATTEMPT WAS A LEARNING EXPERIENCE THAT BROUGHT CORONA EVER CLOSER TO SUCCESS.



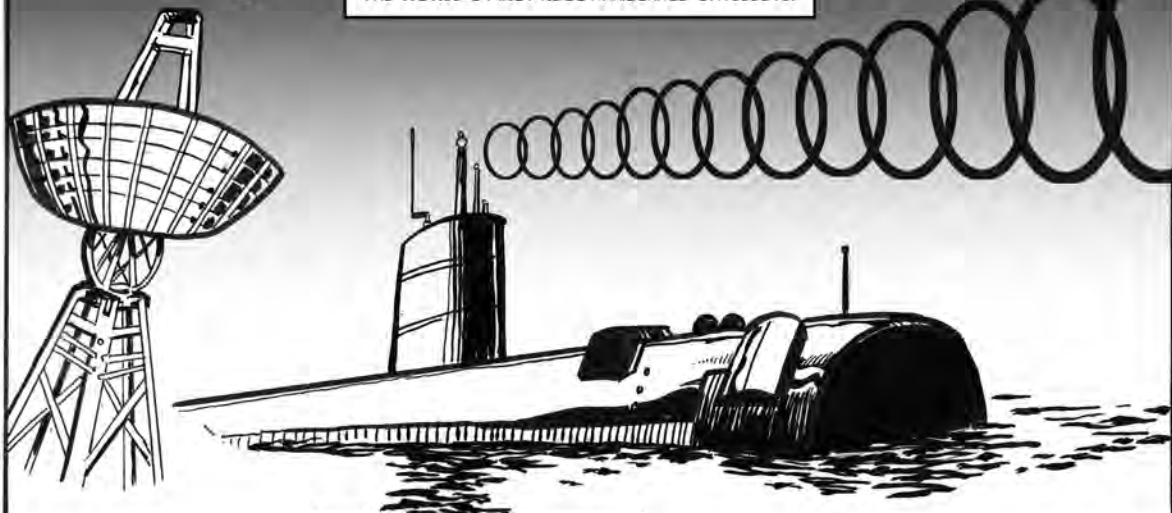
THE CORONA MISSION WAS PUBLICLY KNOWN AS "DISCOVERER..."



...AND THE COVER STORY WAS THAT THE U.S. WAS JUST TRYING TO LAUNCH MICE AND OTHER ANIMALS INTO ORBIT TO SEE HOW OUTER SPACE WOULD AFFECT THEM...WHICH WAS TRUE, BUT THE CAPSULES WERE ALSO TESTING OUT SPY TECHNOLOGY! THE COVER STORY HELD, AND DESPITE SOME GROWING PAINS, THE CORONA TEAM WAS CONFIDENT THAT SUCCESS WAS JUST AROUND THE CORNER!

GRAB

THE WORLD'S FIRST RECONNAISSANCE SATELLITE!



ALSO IN 1959, SCIENTIST REID MAYO OF THE NAVAL RESEARCH LABORATORY DRAFTED A SIGNALS INTELLIGENCE, OR "SIGINT" SATELLITE PROPOSAL. MAYO HAD PREVIOUSLY DEVELOPED RADAR DETECTORS FOR THE NAVY WHICH WERE MOUNTED ON SUBMARINE PERISCOPES. HE SUSPECTED THE SAME TECHNOLOGY COULD BE USED TO DETECT RADARS AND OTHER SIGNALS FROM SPACE!

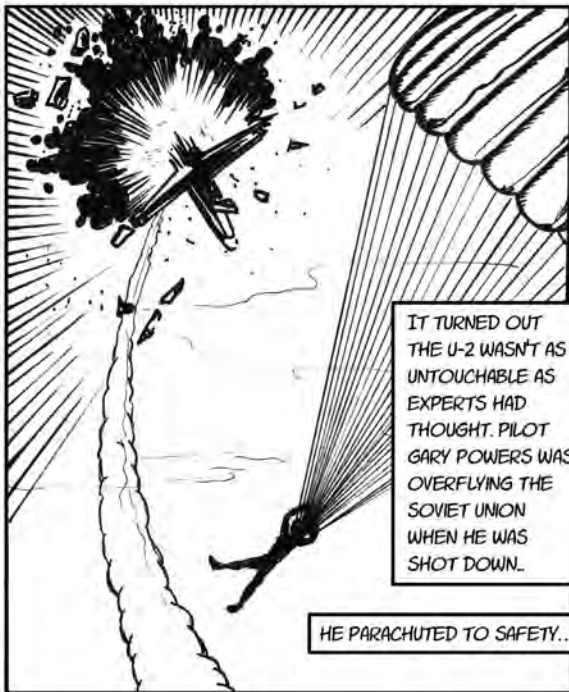
THE SATELLITE'S TRUE MISSION WAS CONCEALED BY THE CODE NAME "GALACTIC RADIATION AND BACKGROUND," OR GRAB! IF EVERYTHING WORKED AS INTENDED, GRAB COULD DETECT RUSSIAN SIGNALS - INCLUDING RADAR SITES - FROM THE SAFETY OF SPACE!

ALL WE NEED TO DO IS RAISE THE PERISCOPE 500 MILES!

ALL SYSTEMS WERE GO FOR A MID-YEAR LAUNCH ...

WHEN AN UNEXPECTED INTERNATIONAL CRISIS NEARLY BROUGHT THE HOUSE DOWN!

REID MAYO,
"GRAB" INVENTOR

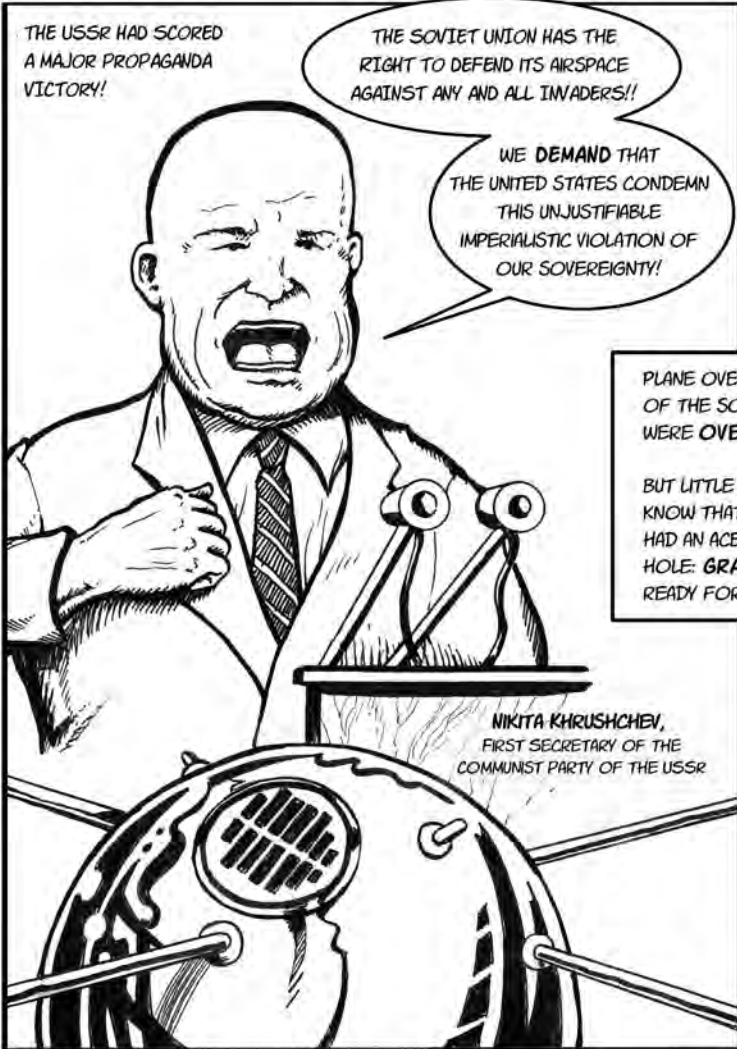


IT TURNED OUT THE U-2 WASN'T AS UNTOUCHABLE AS EXPERTS HAD THOUGHT. PILOT GARY POWERS WAS OVERFLYING THE SOVIET UNION WHEN HE WAS SHOT DOWN.

HE PARACHUTED TO SAFETY...



...BUT WAS CAPTURED AND JAILED BY THE USSR.

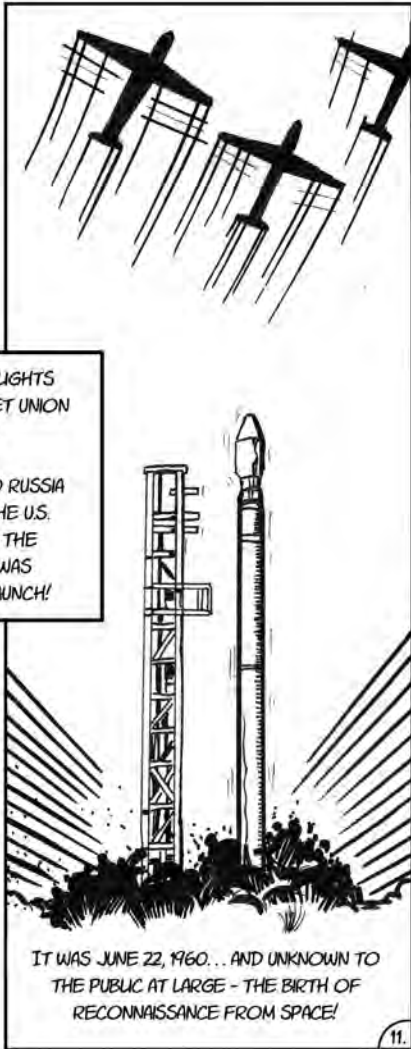


THE USSR HAD SCORED A MAJOR PROPAGANDA VICTORY!

THE SOVIET UNION HAS THE RIGHT TO DEFEND ITS AIRSPACE AGAINST ANY AND ALL INVADERS!!

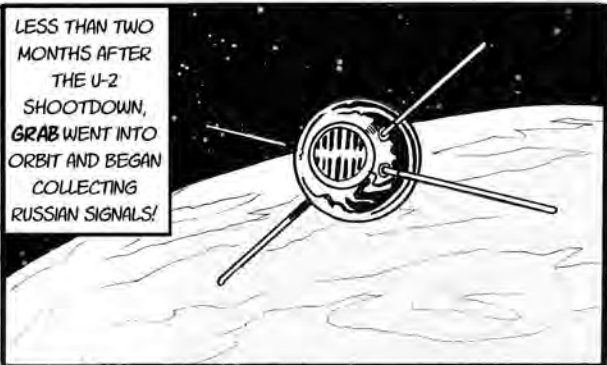
WE DEMAND THAT THE UNITED STATES CONDEMN THIS UNJUSTIFIABLE IMPERIALISTIC VIOLATION OF OUR SOVEREIGNTY!

NIKITA KHRUSHCHEV, FIRST SECRETARY OF THE COMMUNIST PARTY OF THE USSR



PLANE OVERFLIGHTS OF THE SOVIET UNION WERE OVER. BUT LITTLE DID RUSSIA KNOW THAT THE U.S. HAD AN ACE IN THE HOLE: GRAB WAS READY FOR LAUNCH!

IT WAS JUNE 22, 1960... AND UNKNOWN TO THE PUBLIC AT LARGE - THE BIRTH OF RECONNAISSANCE FROM SPACE!



NIXON - KENNEDY TV DEBATES, 1960

FOR YEARS, CRITICS OF THE EISENHOWER ADMINISTRATION HAD ACCUSED THE U.S. OF FALLING BEHIND IN ROCKET AND ATOMIC BOMB TECHNOLOGY...



IN FACT, CORONA'S IMAGERY, BOLSTERED BY GRAB'S SIGINT COLLECTS, PROVED THE OPPOSITE! THE U.S. DOMINATED THE USSR IN TERMS OF BOMBS, MISSILES, ROCKETS, AND EVEN LONG RANGE BOMBERS! SOME ESTIMATES EVEN PLACED U.S. SUPERIORITY AT A 10 : 1 ADVANTAGE. WHEN KENNEDY ASSUMED THE PRESIDENCY IN 1961, HE WAS PLEASANTLY SURPRISED ...



CORONA WAS A TRIUMPH OF
ENGINEERING, PLANNING AND SKILL.

FIRST, CORONA
WAS LAUNCHED
INTO ORBIT.



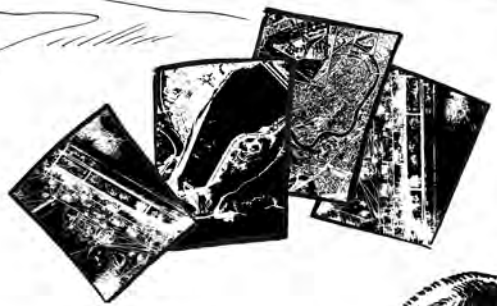
... THEN, PICTURES
WERE TAKEN WITH CORONA'S SPECIAL
CAMERA. HIGH-RES FILM CAPTURED IMAGE AFTER
IMAGE OF DENIED SOVIET TERRITORY DURING MULTIPLE ORBITS.

THE FILM, CRADLED IN A SPECIAL HEAVY DUTY
HEATPROOF BUCKET, WAS EJECTED FROM
SPACE WHEN FILM RAN OUT.



THE CAPSULE'S HEAT SHIELD, SIMILAR
TO THE SHIELD THAT WOULD LATER
PROTECT ASTRONAUTS RETURNING
FROM THE SPACE MISSIONS, KEPT
THE FILM SAFE DURING RE-ENTRY!

THE CAPSULE'S
PARACHUTE ENGAGED,
AND SPECIALLY
TRAINED CREWS OF
JC-130s WOULD
SWOOP IN AND
SNATCH IT OUT OF
THE AIR!



THE FILM WAS THEN TRANSPORTED
TO A SECRET DEVELOPING FACILITY
IN ROCHESTER, NY.

AND THEN TAKEN TO
WASHINGTON, DC FOR ANALYSIS.



IT WAS A COMPLEX PROCESS WHICH THE NRO UTILIZED TO GREAT
SUCCESS! SECRET CORONA IMINT, AND ACCOMPANYING SIGINT FROM
GRAB, COULD BE GATHERED WITHOUT ANY RISK TO HUMAN LIFE.



THEN - THE WORLD WAS UNEXPECTEDLY DRAWN INTO THE CUBAN MISSILE

AND WITH NOTHING LESS THAN THE FATE OF THE WORLD AT STAKE, CORONA PHOTOGRAPHY PLAYED A CRITICAL ROLE!

CRISIS!

WARREN FIELD LAUNCH SITE
SAN CRISTOBAL, NO. 3
14 OCTOBER 1962

JFK WITH ARTHUR LUNDAHL, DIR., NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

THIS JUST CAME IN FROM OUR U-2s - MEDIUM RANGE BALLISTIC MISSILES IN SAN CRISTOBAL!

UNBELIEVABLE! THE SOVIETS REALLY DID IT! NUCLEAR WEAPONS IN CUBA!

JUST 90 MILES OFF OUR COAST!!

THE U.S. INSISTED THAT THE MISSILES BE REMOVED, AND THE USSR REFUSED - EVEN UPON THREAT OF WAR!

THIS THREAT TO THE SECURITY OF OUR HEMISPHERE MUST BE REMOVED!

WE WILL NOT GIVE IN TO THESE DESPOTIC DEMANDS FROM THE UNITED STATES!

CUBA STANDS WITH RUSSIA AND WILL DEFEND OUR LAND AGAINST ANY IMPERIALIST ATTACKS!

FORTUNATELY, NO MATTER HOW TENSE THE NUCLEAR SHOWDOWN GOT, THE U.S. KNEW THEY HAD AN ACE IN THE HOLE: TACTICAL SUPERIORITY!

AND SURE ENOUGH, WHEN PUSH CAME TO SHOVE, RUSSIA BACKED DOWN. THE MISSILES WERE REMOVED FROM CUBA-

CORONA PHOTOGRAPHY HAD CONCLUSIVELY PROVEN THAT THE U.S. HAD A MAJOR ADVANTAGE IN MISSILES, AND SUPERIOR NUMBERS OF PLANES, SUBMARINES AND LAUNCH SILOS TO DELIVER THEM!

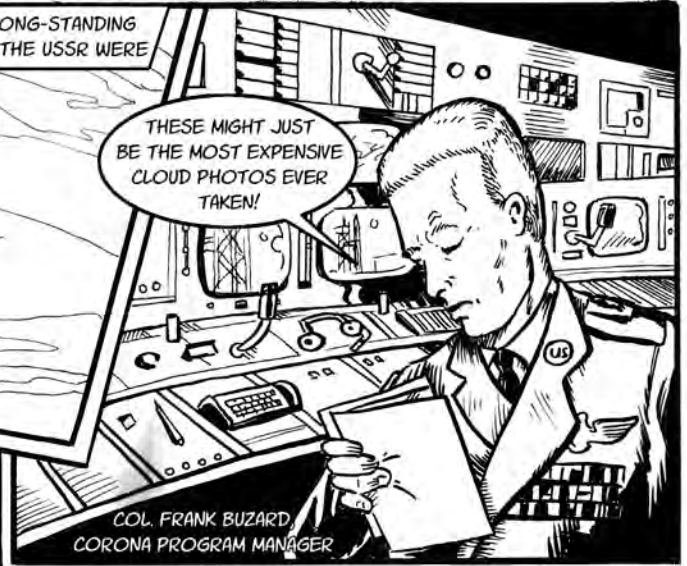
THANKS IN GOOD MEASURE TO CORONA!

YOU'VE MADE THE CORRECT DECISION, PREMIER KHRUSHCHEV. THE WORLD WILL BE SAFER FOR IT.



SOON, THE **CORONA** TEAM SET OUT TO SOLVE A LONG-STANDING PROBLEM...TOO MANY HARD EARNED PHOTOS OF THE USSR WERE BEING RUINED - BY CLOUDS!

THESE MIGHT JUST BE THE MOST EXPENSIVE CLOUD PHOTOS EVER TAKEN!



COL. FRANK BUZARD
CORONA PROGRAM MANAGER

FORTUNATELY, IT LOOKED LIKE A RECENT **NASA** SATELLITE MIGHT HOLD THE ANSWER! THEIR 'TELEVISION INFRARED OBSERVATION SATELLITE,' OR **TIROS**, LAUNCHED IN 1960, PROVIDED THE FIRST SATELLITE PHOTOS OF THE EARTH.



THE IMAGERY WAS LOW RESOLUTION, BUT IT WAS GOOD ENOUGH TO REVEAL BREAKS IN CLOUD COVER... AND THE TV SIGNALS COULD BE VIEWED IN REAL-TIME! THE NRO SECRETLY MODIFIED THE **TIROS** DESIGN AND SOON HAD A SMALL CONSTELLATION OF 'DEFENSE METEOROLOGICAL SATELLITE PROGRAM,' OR **DMSP** SATELLITES, TO SCOUT FOR CLOUD COVER BREAKS TO ALLOW BETTER CORONA PHOTOGRAPHY!



TIROS



DMSP

ALSO, KEPT SECRET FOR MANY DECADES: IN THE DAYS BEFORE SATELLITE WEATHER FORECASTS, MODIFIED **DMSP** SATELLITES SCOUTED FOR BREAKS IN CLOUD COVER TO CARRY OUT AIR MISSIONS - IN **VIETNAM!**



AND TACKLING THE PROBLEM OF CLOUD COVER DIDN'T END THERE!

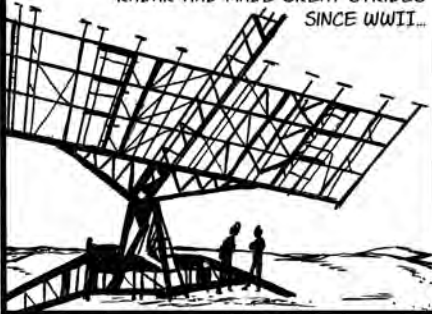
RADAR HAD PROVED ITS WORTH DURING WWII. EARLY EXPERIMENTS HAD SHOWN ITS ABILITY TO DETECT PLANES FROM GREAT DISTANCES!

RADAR!

IT WAS AN ALL-WEATHER, DAY OR NIGHT SURVEILLANCE SYSTEM - AND IT COULD SEE STRAIGHT THROUGH CLOUDS!



RADAR HAD MADE GREAT STRIDES SINCE WWII...



BECOMING ESSENTIAL FOR COMMERCIAL NAVIGATION AND AIR DEFENSE.



RADAR WAS IN USE ALL AROUND THE WORLD...

BUT WOULD IT WORK IN SPACE? AIR FORCE MAJOR DAVID BRADBURN OVERSAW THE HISTORIC NRO RADAR SATELLITE EXPERIMENT KNOWN AS -

PROJECT: QUILL

IN DECEMBER 1964, QUILL WENT INTO ORBIT, WITH THE NRO AGAIN IN PURSUIT OF A HISTORIC FIRST!



MAJ. DAVID BRADBURN



IT'S THEORETICALLY POSSIBLE. RADAR WORKS RELIABLY FROM OUR HIGHEST FLYING AIRCRAFT, AND EVEN THOUGH THE DISTANCES ARE ORDERS OF MAGNITUDE DIFFERENT IN SPACE,

THE CALCULATIONS SAY IT SHOULD WORK!

AND IT DID! DURING ITS SHORT LIFE ON ORBIT, QUILL EXCEEDED EXPECTATIONS, AND THE WORLD'S FIRST SYNTHETIC APERTURE RADAR EXPERIMENT WAS A SUCCESS!

SIGNALS, PHOTOGRAPHY AND NOW RADAR - WE'VE DONE IT ALL!

THE NRO HAD FIRMLY ESTABLISHED ITSELF AS THE WORLD LEADER IN RECONNAISSANCE FROM SPACE - BUT EVEN GREATER CHALLENGES STILL LAY AHEAD!



END PART 1

CENTER FOR THE STUDY OF NATIONAL RECONNAISSANCE

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