

# Johnsville Center Leads Nationwide Naval Research

By JOSEPH DUNPHY  
Of The Inquirer Staff  
First in a Series

SINCE the later stages of World War II, Johnsville Naval Air Development Center has been improving the Navy's air capabilities through

research and development of aeronautical systems and components and through work in aviation medicine. Its history is filled with patent awards and citations for outstanding accomplishments by project teams and individuals.

Civilian applications of the center's work have had a tremendous impact on government, industry and the community. But, while Johnsville has kept the naval air arm abreast of technological innovation in the field and, in

doing so, aided the general public, it has not been without opposition. Critics of defense spending have argued against the millions the Navy pours into Johnsville every year for development work. Local municipal officials

have staunchly opposed housing plans for the center's enlisted personnel and efforts to close off Jacksonville rd., which runs through the heart of the security-sensitive installation.

But the center, now in its 25th year, remains the primary research and development headquarters for the nation's naval air power.

Located on 752 acres at Jacksonville and Street rds. in Warminster, Johnsville was acquired by the Navy in 1944. It took over the Brewster Aircraft Corp. plant on the site.

The center's mission during the war involved conversion and modification of Navy aircraft for fleet combat units. After the war, Johnsville (known to those assigned to the base as NADC) began research and development activities in earnest. Through the years, various functions of the Naval Materials Command were funneled into the framework of the center's present mission.



Aerial view shows part of Johnsville Naval Air Development Center at Jacksonville and Street rds.



Today, the center also maintains departments at the Navy Yard in South Philadelphia and at a small testing facility in Ireland in Montgomery County, Pa.

Research and development work at the center has had its impact on the nation's defense. A system which would permit a pilot in a crippled

aircraft not only to eject himself from the plane, but to fly his seat to the nearest landing field.

Another program which would give a city complete traffic control, patterns for a proposed highway or expressway and a system for highway or road acquisition is being developed.

Continued on Page 1, Column 1

## Bristol Homeowner 60 Percent Jur

By RICH

Bristol Borough property owner year. The money would make \$3000 would pay \$14 a year.

## Jannotti Ridicules Protest in Council On His Installation

By ROBERT FENSTERMAKER  
Of The Inquirer Staff

Councilman Harry P. Jannotti's first reaction to the protesters who sought to prevent him from taking a seat in City Council last week was "no comment." But then he started to talk.

"I have chosen to ignore these protests and concentrate on serving the people of my district (Kensington-North Philadelphia), not fight them," he said. "After all, if they wanted to keep me from being councilman they should have prevented me on election day, not now. A plurality of 4000 voters said I should be their councilman," he said quietly.

### IS IN PROTEST

Jannotti pointed out that the protesters at City Council's meeting, when he was re-elected as councilman from the 7th Councilmanic District, numbered 15. "Are 15 people going to say who or who should not be councilman," he asked. Jannotti said that in the two weeks before the election he was elected to fill two years of the unexpired term of Councilman Joseph J. Hersch, who died Oct. 17, 1968, and last Thursday when he was seated, he spent his time being a councilman and not worrying about those who questioned his qualifications.

Planning absorbed much of his time.

### HOUSING FIRST

"The first thing I have in mind as a program," he said, "is housing. There is much deteriorating housing in the district that is still in good shape. The first thing I should be doing is to get that started." In his first session as a councilman, Jannotti introduced a resolution to support the claims of mothers whose sons were killed in Vietnam and who do not wish their sons' names used in peace demonstrations. And he introduced a bill to require changing parking regulations.



HARRY JANNOTTI

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### WITH BUCKS SINCE '51

Comptroller Walter S. F. Jannotti Jr. had objected to the borough's deficit of \$100,000.

### OFTEN IN DISPUTES

Park board members had charged him with "administrative inefficiency." Civic groups charged him with "politics."

### WARNING REVEALED

Such a warning could set the present 25 mill borough rate doubled to 50 mills, if the court would permit it.

### POLITICS CHARGED

His opponents have contended that he really lives with his family at 256 Edgemoor rd. Abington.

## The Philadelphia Inquirer

# REPORTS ON N.A.D.C.

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## Prison Work Program Light Freedom Is Biggest Problem

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### TERS UNAFFECTED

of the main reasons for the prison work program is that it is not a work-release program.

### ARE AWAITING DISCHARGE

are awaiting discharge or transportation. The law to involve detainees in work programs.

### WE HAVE PRISONERS WORKING

We have prisoners working in the dining room and sweeping up. Hendrick said, "but, except for three duties two hours a day, they are in idleness."

### NEXT BEST THING

Besides the Detention Center, the city prison system includes the House of Correction at 800 State rd. and Holmesburg Prison, 8215 Torresdale ave.

### PROVIDE TRAINING

"We can turn idle inmates into manpower to supplement the labor force," he said. "The only way to solve this problem is to pay the prisoners the going rate for the particular kind of work they will be doing, he said."

### HOUSE OWNERS TARGET OF SUIT

A suit seeking to restrain owners from harassing residents of Warminster, an 1100-unit development built by the government for emergency housing during

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## Cuban Guitarist

Abington

Abington

Abington

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A series of four articles concerning the Naval Air Development Center was published in the Philadelphia Inquirer. The purpose of the articles was to make residents of the Philadelphia area aware of this important Navy research and development facility.

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# Johnsville Center Leads N

By JOSEPH DUNPHY  
*Of The Inquirer Staff*

First in a Series

SINCE the later stages of World War II, Johnsville Naval Air Development Center has been improving the Navy's air capabilities through

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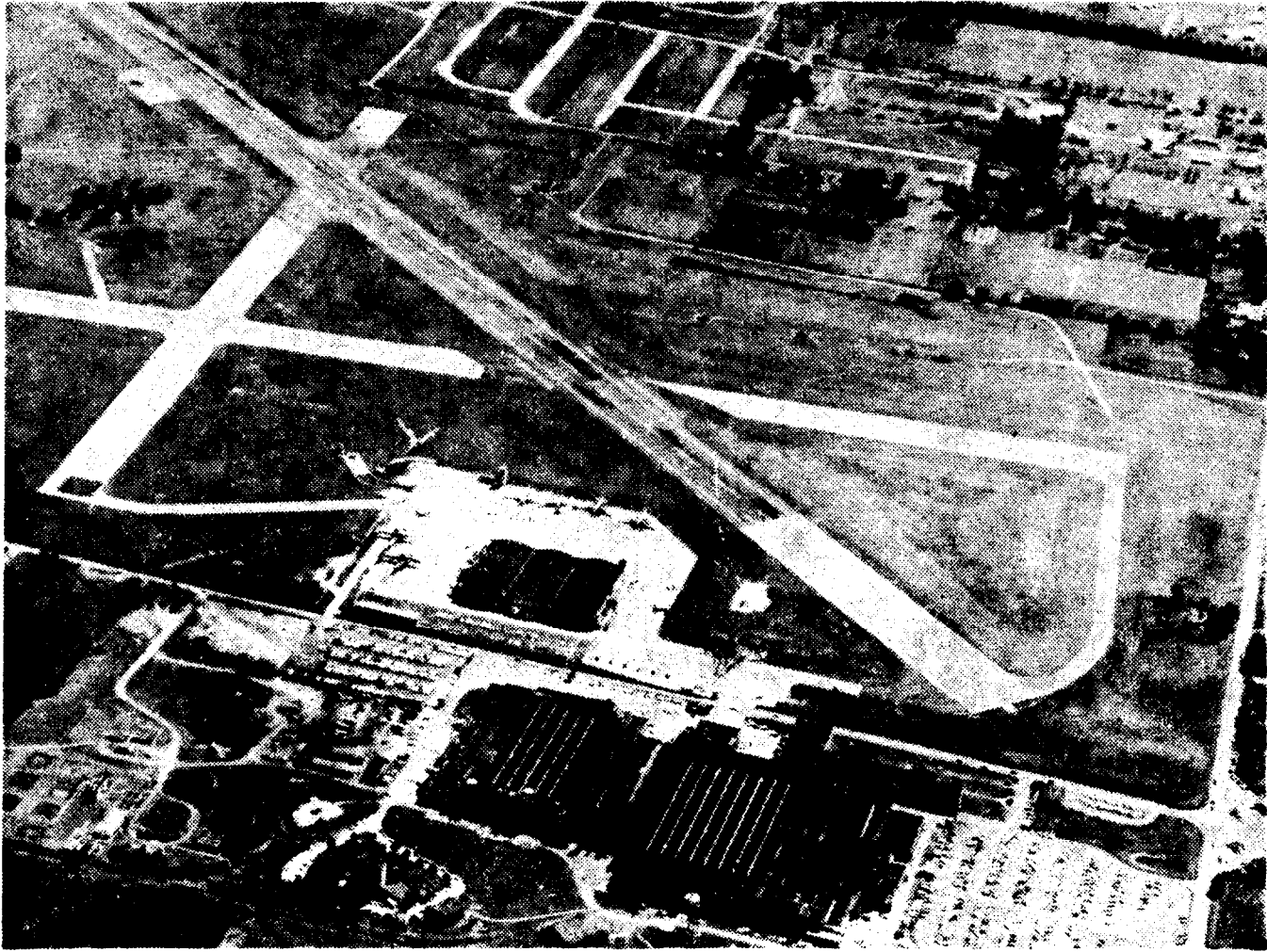
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Local municipal officials



Aerial view shows part of Johnsville Naval Air Development Center at Jacksonville and Street rds.,

Warminster. The center is one of Navy's largest and best equipped research and development facilities.

# 'ationwide Naval Research-!

have staunchly opposed housing plans for the center's enlisted personnel and efforts to close off Jacksonville rd., which runs through the heart of the security-sensitive installation.

But the center, now in its 25th year, remains the primary research-and-development headquarters for the nation's naval air power.

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The center's mission during the war involved conversion and modification of Navy air-

craft for fleet combat units.

After the war, Johnsville (known to those assigned to the base as NADC) began research and development activities in earnest. Through the years, various functions of the Naval Materials Command functioned into the framework of the center's present mission.

Today, the center also maintains departments at the Navy Base in South Philadelphia and a sonar-testing quarry near Orelan in Montgomery County.

Research and development at the center has had its impact in such far distant places as the bottom of the sea (sub-

marine-detecting devices) and the moon (perfecting nonorganic lubricant for color television transmission).

While all projects at NADC are geared to the military application of science and technology, department heads, supervisors and project workers see universal applications for much of the center's work.

Among some of the more interesting unclassified projects they can describe are:

-Implanting the written matter from every page of every hook in the city's Free Library system onto a single grain of salt.

-A system which would permit a pilot in a crippled

aircraft not only to eject himself from the plane, but to fly his seat to the nearest landing field.

-A program which, would give a city complete traffic-control patterns for a proposed highway or expressway complex even before roadwork or land acquisition is begun.

-Simple blood tests that can determine such psychological factors as combat fatigue and schizophrenia.

All of these are now in use, or ready for final development.

Much of the equipment used to research, design, develop,

Continued on Page 4, Column 1

Continued from First Page

test and evaluate projects at the center is rated as the most advanced of its type in the world.

\* \* \*

**FACILITIES** include a centrifuge that can exactly simulate conditions in high-speed-aircraft and space travel.

The centrifuge, the world's largest, consists of a spheroid gondola, 10 feet in diameter, mounted at the end of a 50-foot tubular-steel arm.

Driven by a 4000-horsepower motor, it can accelerate loads up to 1000 pounds to 40 Gs (40 times its own weight) in 6 seconds. Vacuum can be regulated to the 100,000-foot-altitude level during motion, and temperatures can be regulated from 40 to 110 degrees Fahrenheit.

Other major technical facilities include:

-Power and environmental equipment for testing ideas and equipment.

-An extremely flexible network of computers.

-A building designed specif-

ically to test Inertial-guidance systems for such things as space missions. It contains a "quiet laboratory" designed and constructed to keep noise and vibrations to an absolute minimum. The testing area contains 12 piers bonded to bedrock well below the surface of the earth.

-Structural-testing equipment capable of exerting compression and tension up to 5 million pounds.

-A bio-astronautical test laboratory which provides controlled conditions for determining psychological and physiological aspects of long-term flight operations.

\* \* \*

**JOHNSVILLE'S** commander, Capt. Frank W. Ewald, credits much of the praise given the center to its high degree of professionalism on the staff of 2200 civilian and 450 military personnel.

"Many can do better financially on the outside," the captain said, noting the more than 1000 technical or professional degrees attained by staff members.

But, he said, employees prefer to remain at the center, where "they can be at the state of the art," which translates to operating at the outer limits of knowledge.

Capt. Ewald said both civilian and Navy personnel, though not ranked high by civilian salary schedules, have a great deal of responsibility because of their contacts with large segments of government spending, which includes this year's \$85 million NADC budget.

"They have influence out of proportion to their pay scale," he said.

Capt. Ewald is a firm believer in the need for the defense work he oversees.

"I believe the country and the taxpayers as a whole are going to want to maintain strength on the high seas," the captain said. "The activities at the center are essential to maintaining these capabilities."

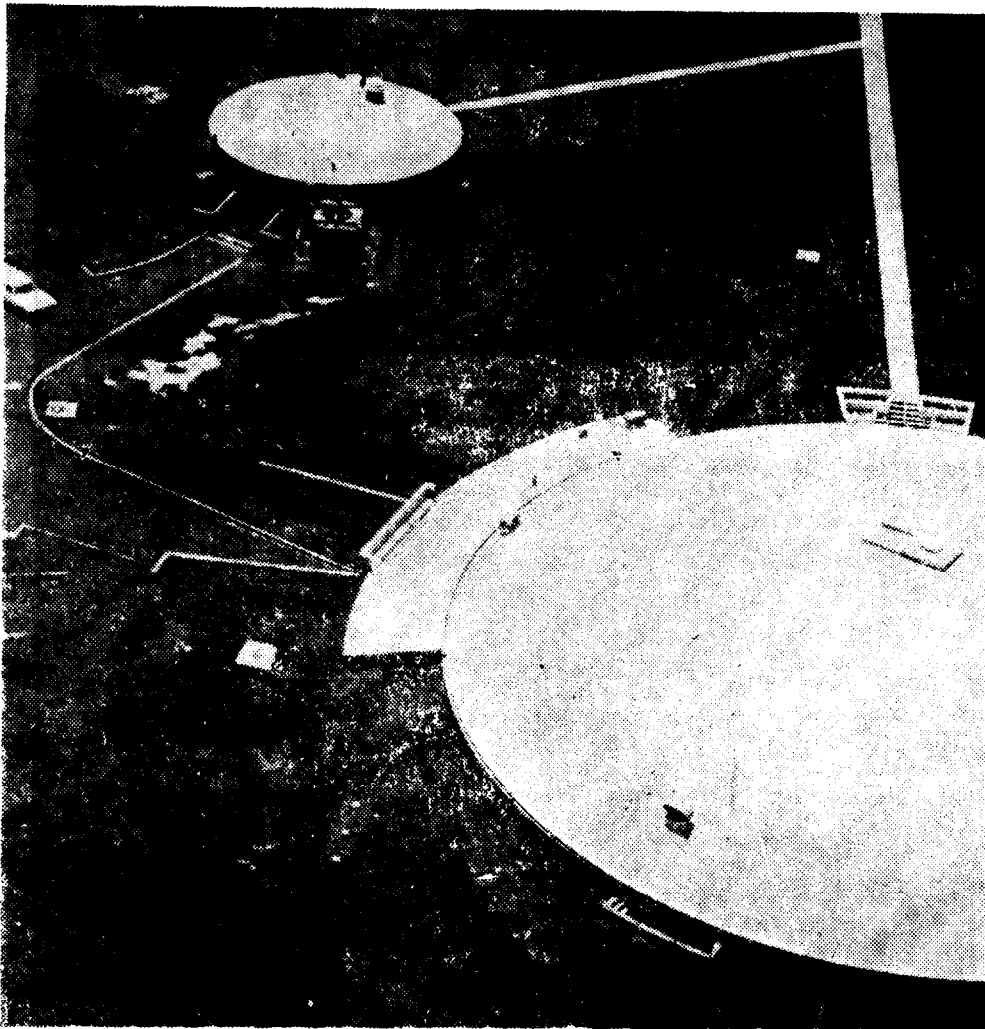
The country must maintain certain responsibilities in its role of world leadership, he said.

"We are in the insurance business," Capt. Ewald said, explaining that world power is an essential to world peace.

In light of President Nixon's de-escalation policies in Vietnam, the Johnsville commander said, "it is tempting to think that the taxpayer will be getting out of the defense business, saving on taxes."

"But as long as we are in a position of world leadership, there is a need for military defense capabilities."

To Be Continued Thursday



The large domed building in lower right in this aerial photo is the "quiet room," a below ground structure at **Johnsville** Naval Air Development Center in which guidance instruments are tested for missiles and aircraft.

# Johnsville Aids Navy Flyers

**Second in a Series**

By **JOSEPH DUNPHY**

Of *The Inquirer Staff*

**RESEARCH** and development projects carried out at Johnsville Naval Air Development Center appear in every Navy aircraft currently in operation.

Johnsville's work ranges from development of fire-resistant suits for pilots to such things as a system of complex computerized instruments for the detection of submarines from aircraft, Project A-NEW.

The A-NEW system, one of the center's most publicized gifts to naval warfare, was designed and developed by the Systems Analysis and Engineering Department (SAED) at Johnsville.

It combines many submarine sensing devices into a single unit controlled and coordinated by computers.

According to SAED director Frank Whiteman, A-NEW employs radar, electronic sonobuoys, infra red and other scanning equipment and magnetic anomaly detectors.

"This sensing information is fed into a computer, programmed to disregard false alarms," the director said. "Results are then put on a central display which tells the operator exactly where the sub is located and what it is doing."

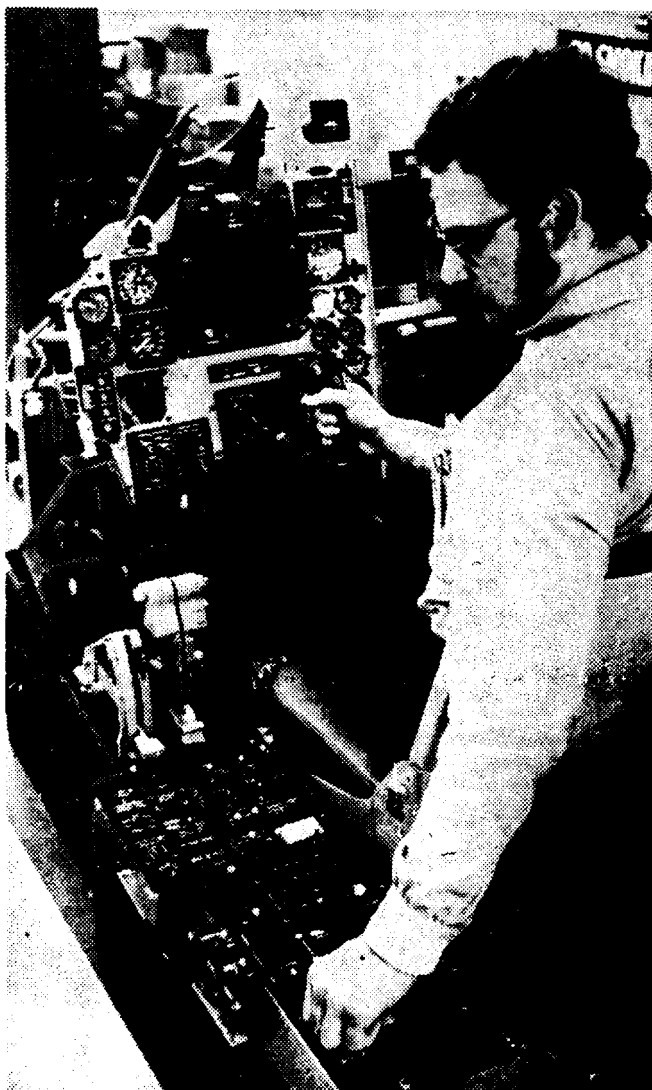
By combining the sensing devices, the pilot and his crew have full information on the submarine and are able to make a reasoned decision on what course of action the aircraft should take, Whiteman said.

He noted that a new aircraft, the **S-3A**, is being specifically designed to carry the "integrated avionics system."

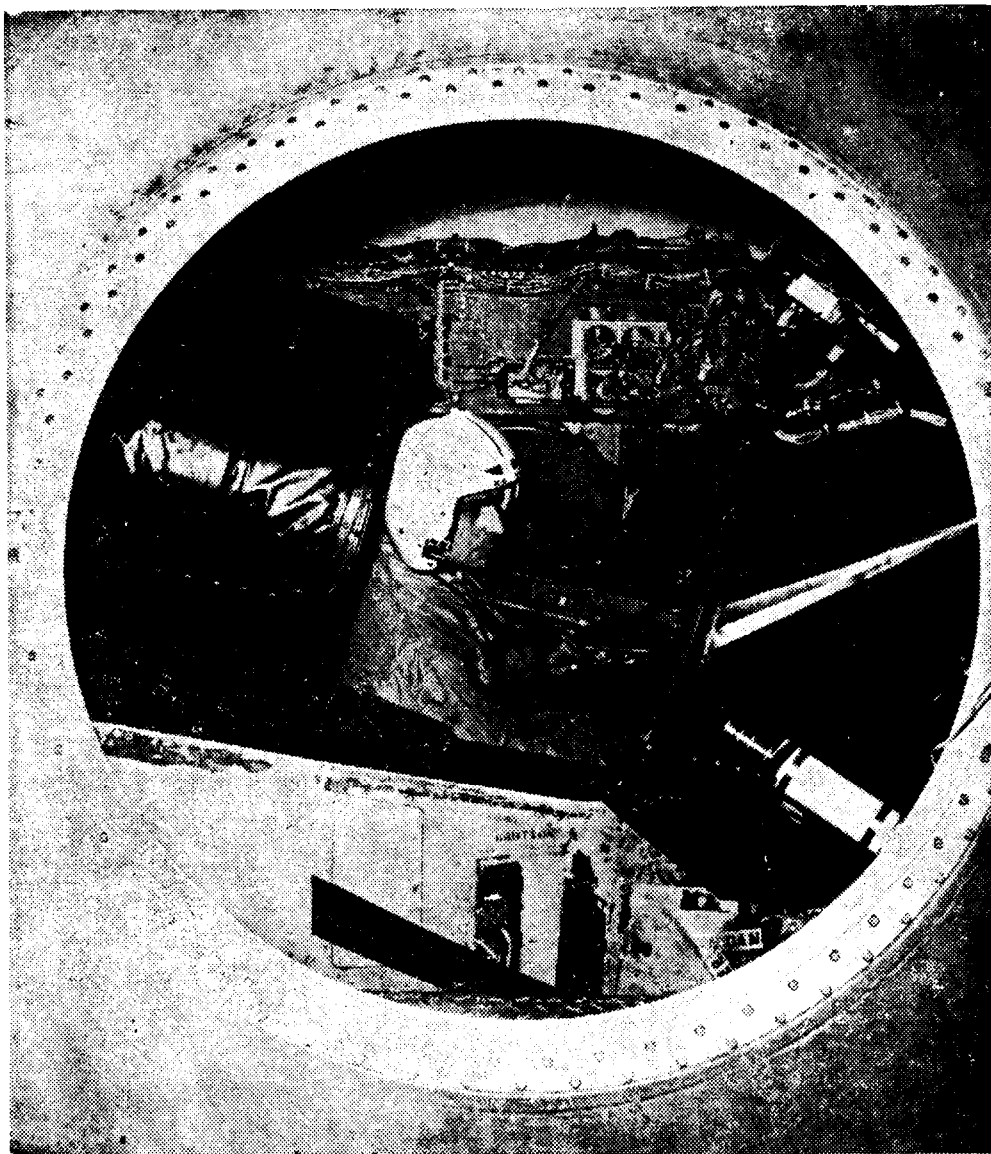
"The A-NEW system is becoming standard fleet equipment," the director added.

Johnsville, located at Street and Jacksonville rds. in Warminster, is composed of seven departments dealing with aeronautical systems and components and research and development work in aviation medicine.

The departments and a limited description of their functions are:



**Engineer Norman Yastrov runs combat simulation tests coordinated by computers in the cockpit of Phantom F-4 11, the Navy's best jet aircraft.**



Research psychologist Don Morway works in gondola of Johnsville Naval Air Development Center centrifuge, testing reaction in cockpit transplanted from F-4 fighter **to** extreme stress, particularly that of a high-speed spin.



**Aero Electronic Technology—**  
**Handles aeronautical electronic systems in the area of ant&marine, antiair, strike and electronic warfare.**

**Aero Mechanics —** Aircraft and missile aerodynamics and that of related systems.

**Aerospace Medical Research —** Wide-b a n d investigation with emphasis on physiological aspects of acceleration on the human body.

**Systems Analysis and Engineering—**Development and improvement of concepts of naval warfare, backed by a major network of computers.

**Aero Structures—**Checks on structural reliability and adequacy of naval aircraft and air-launched missile systems.

**Aero Materials —** Work in the fields of aerospace material; and airborne equipment.

**Aerospace Crew Equipment —** Establishes criteria for air crew safety escape, survival **systems** and related equipment.

Johnsville maintains a naval air facility that has the aircraft, material and services to **support** the operations of departments in the center's **structure**. \* \* \*

**T**WO major simulation projects at Johnsville have been beneficial to pilots by plunging them into critical situations that most of them would not otherwise experience.

One, termed "Kiwi," consists

of two equipped **cockpits** that are computer-fed with complete performance functions of every known aircraft in the world.

Instruments in the cockpits — and a screen **that** simulates the pilot's view of the earth's contour and opposing aircraft — simultaneously react to control directions given by the pilots.

Both pilots can engage in a simulated dogfight, using weapons from any of a dozen major airpowers;

The dogfight, the director said, is not only good experience for pilots, but is a practical way to evaluate performances of different types of aircraft under combat conditions.

In Aerospace Medical Research, another and even more exacting simulation project is in effect.

Richard Crosbie, head of the department's dynamic simulation division explained a spin simulation test for **the F-4B**, the Navy's standard jet fighter.

The centrifuge, the world's largest, has a 10-foot-diameter gondola mounted at the end of a **50-foot** tubular steel arm that can simulate the G forces a pilot feels when the high speed jet goes into a dive.

"By means of a hybrid (analog and digital) computer, the pilot can receive a certain ride," Crosbie said. "The computer also notes what he does with the stick (Controls)."

He **expl** **ined** when an F-4 goes into 1 spin it is almost impossible for even the most experienced to bring it out. This results in the loss of an expensive craft and sometimes fatalities.

With the spin simulation, however, pilots get first-hand experience on the effects of spins and, with their computer-controlled instruments, learn to pull the plane out of a dive. \* \* \*

**O**FFICIALS emphasized that most of the projects are the direct results of ideas

from staff members.

And the **ideas** most often are sparked by "a system **that** funnels information on **techno**-logical innovation **and** experimentation **throughout** the country **into** the center, giving research personnel an opportunity to combine findings, theories on new equipment **and** processes into a spring-board for new areas of work.

Capt. Edward J. Kingsbury Jr., director of the Aero Mechanics Department, cited the "quality people" **the** Navy employs at Johnsville.

**O**f the 2600 civilian and military personnel, more than 1000 have technical and professional degrees.

"Projects start with good ideas that come from technological forecasts, **things** that will be needed," Capt. **Kings**-bury said..

His department can boast of such projects as a camera that can detail footprints from an altitude of 40,000 feet, an aerial delivery system employing rockets that can place supplies on pinpoint location to isolated troops and targets for aerial **gunnery** that **can** be towed **up** to 100,000 feet behind an aircraft.

\* \* \*

**T**HE Navy encourages its personnel to submit ideas for evaluation and funding, Capt. Kingsbury said, and, in fact, there is untapped money in **the** center's budget **for** just such a purpose.

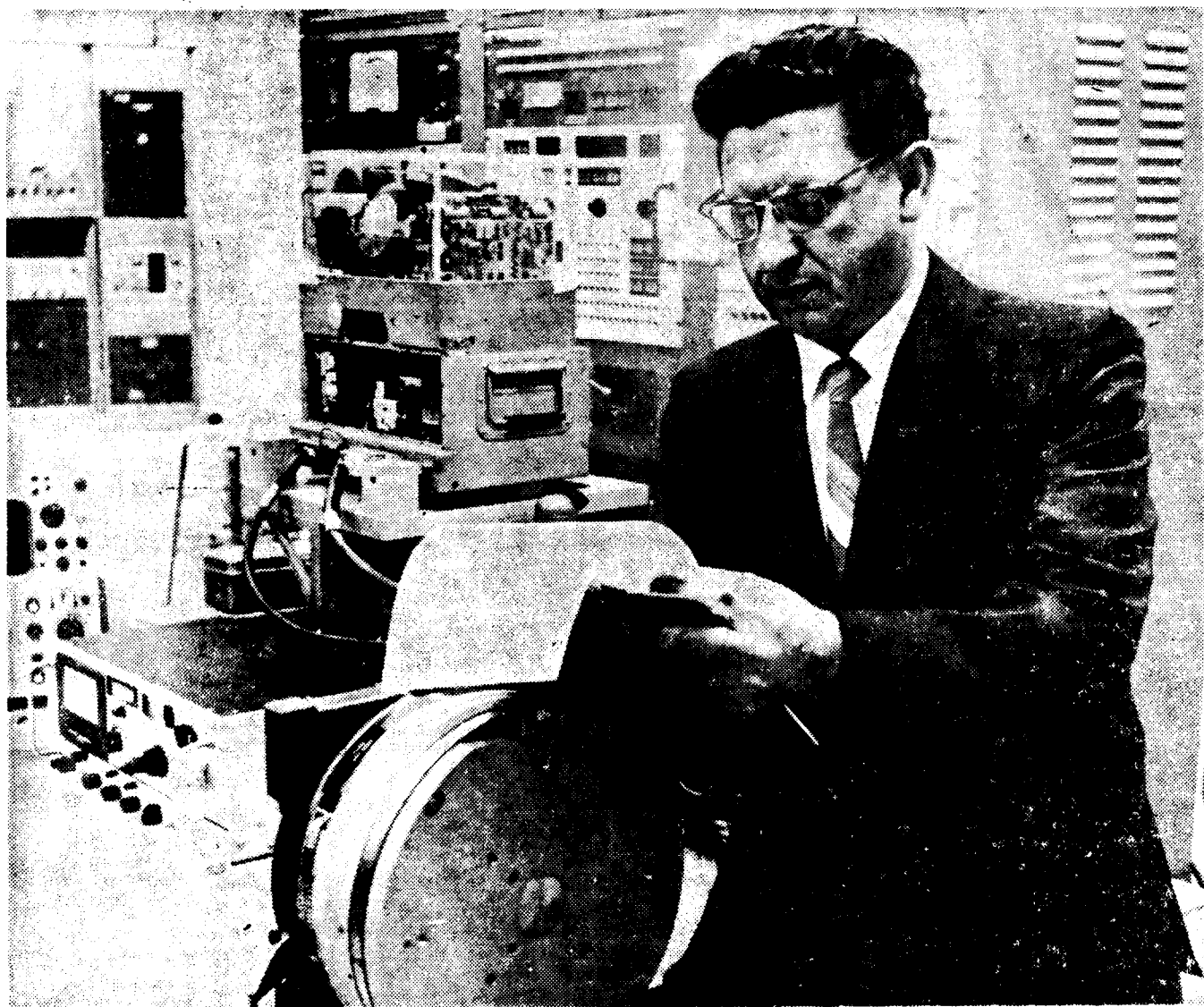
"There are no good ideas that you can't get funded," the captain added.

Projects at the center have saved countless lives, **he** noted, because safety and **sur**-vival have been of **paramount** importance in every department.

This figure, he said, is **hard** to compute when you try **to** put down on paper the **actua**l benefits of many of the projects.

The aero mechanics **director** termed the work at **Johnsville** "a real genuine national **as** set."

To be continued Sunday.



Engineer John Messmer sits on one of 12 piers attached to bedrock beneath Johnsville's "quiet

laboratory" while he checks data on an inertial guidance system used in aeronautic navigation.

## **'Efficiency' Is Buword at Johnsville**

# Naval Center 'Spinoffs' Help Society

By JOSEPH DUMPHY  
Of The Inquirer Staff  
Third in a Series

TAXES that support the \$85 million budget at Johnsville Naval Air Development Center might well be regarded as a matter of investment. Most of the installation's projects benefit not only the Navy but business industry and society as a whole.

"Almost everything we do here has civilian application," noted Johnsville commander Capt. Frank W. Ewald. Work at the center has been applied in such wide-ranging areas as city government, com-

mercial airline operations and the teaching of handicapped children.

Industry plays a large part in development projects at the center, projects which number about 800 at any given time in the aeronautical field alone.

Result of the center's close relationship with industry generally is an increased efficiency and cost reduction in the projects.

At the start of many new developments, NADC establishes specifications after preliminary engineering and feasibility tests on a concept.

The ideas that provide the

basis for most project: usually come from personnel at the center who have at their command the channels through which reports on technical advances and research flow.

Working with information refined at Johnsville, specifications for the project are set. A manufacturer must meet these specifications, although he is allowed freedom of design and construction.

A contractor is selected from among many qualified producers by competitive bidding to the Navy standards.

After he demonstrates that he has an acceptable performing

design, he is authorized to start production.

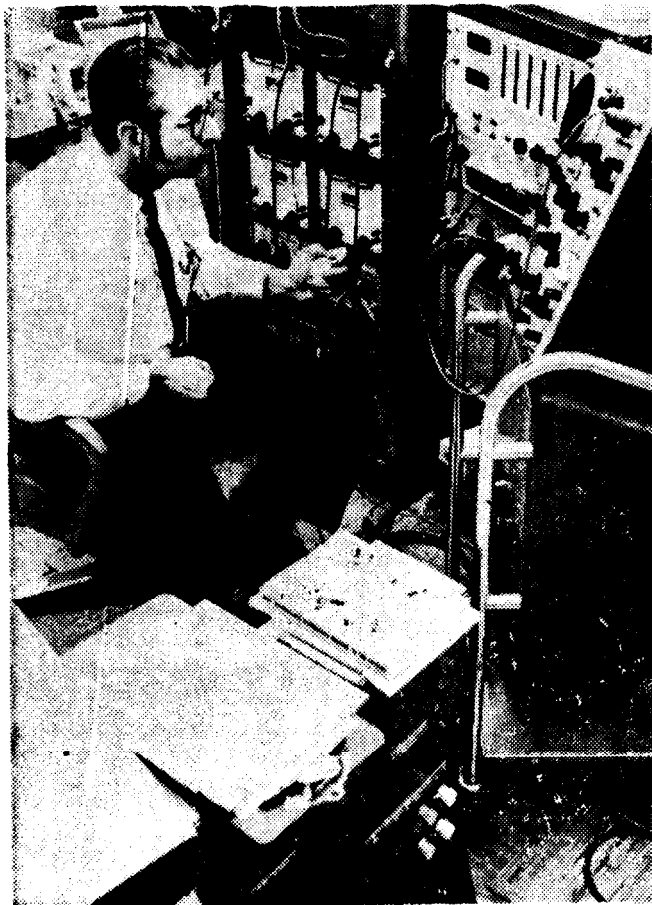
The finished product is tested and must show high reliability. The manufacturer must show ability to meet tight specifications.

If the project fails to meet tests, it will not be purchased until the contractor, through rework, proves he can meet requirements. \* \* \*

THE Navy benefits directly in the development of life and material-saving devices credited to the center.

Through the patent office at

Continued on Page 5, Column 1



George Stewart, an engineer at Johnsville, checks stopwatch during test on accelerometer, a delicate component of the inertial guidance system, mounted on one of the test piers in the "quiet lab."

### 'Efficiency' Is By word

## Johnsville 'Spinoffs' Help General Public

Continued from First Page

Johnsville, the military has also realized savings of millions of Navy dollars by having royalty-free licenses to inventions it might otherwise have had to pay to use.

But it is the general public that receives the most benefit from the operation's at the Street and Jacksonville rds. center in Warminster.

One project, in particular, has such far-reaching possibilities that it could make an \$85 million budget seem like a drop in the bucket compared to the help it could bring to children who are hard of hearing.

The project is called NAACH (Non-Acoustical Coupling to the Head). It is being developed as part of a communications headset for pilots.

It makes hearing possible without the transmission of sound waves.



CAPT. FRANK W. EWALD

The device developed in Johnsville's lab produces electrical impulses which create other impulses when placed on the skin. The combination is carried to the inner ear through the underlying bone structure of the skull.

The project is a cost-saving device for the Navy since the impulse delivery device need be nothing more complex than an ordinary washer. The skin performs the functions of a diaphragm.

Einer Johnson, head of the command and control division of the Aero Electronic Technology Department, said the device has been tested at a school for children who were born with hearing defects.

He said the teachers marveled at the results of the earpiece because it permitted them to speak to a child while standing next to him.

Presently utilized systems require the teacher to stand at the front of the room at a fixed microphone tied into an amplifier tuned to full power and shout to make himself heard by the children who wear heavy earphones.

If the teacher tries to approach a child, feedback from the microphone's proximity to the earphone will override and prevent the child from hearing anything but a flood of sound.

The Navy device, because it does not transmit sound waves which cause feedback, affords the teacher an opportunity to work closely with the children.

Also, since there is no feedback the child can talk into the microphone and hear his own words as he speaks, an invaluable teaching tool since the youngster can make immediate adjustments in his speech after hearing corrections from the instructor.

ANOTHER project is being carried on in the "quiet laboratory," a building designed to shield equipment from noise and vibration. Inertial guidance and navigation systems are under test and development in the partially buried, dome-roofed structure.

The test area contains 12 piers attached, not to the building, but to bedrock 40 feet below the surface.

Navigation systems evaluated in the "quiet room" measure notion (accelerations and

velocities) and can tell a pilot exactly where he is at any given time independent of any kind of ground or star reference.

This means that a pilot or a ship's captain can maintain constant pinpoint determination of position.

Capt. Ewald sees one of the most important contributions the government and Johnsville have made to local government is development of systems analysis engineering through use of computers and simulation.

"It has helped local government solve massive problems they couldn't even consider solving before," the captain said.

The system permits a community to propose a problem or a major project and study almost instantly an infinite number of potential solutions for each.

THROUGH the use of computers and simulation of all the facets of each problem, the best feasible and inexpensive answer can be worked out, eliminating the trial and error method on which cities annually spend millions for less than full-value projects.

Technological development can offer direct benefit to public agencies and private industry.

Capt. Ewald mentioned that police work and plant security could be improved by simply employing the center's developments in the fields of submarine detection and low light television.

The Federal Aviation Agency (FAA), Johnsville's commander noted, could apply other techniques developed by the center in the areas of air collision avoidance and the time saving tasks of taxiing plane! in the fog, or inclement weather.

Johnsville is using minute amounts of atomic sources and ultra-sensitive radiator detectors in air safety development.

Officials in all departments at the center elaborated on civilian application of their Navy-oriented projects to support the view that the government's investment is money spent.

To Be Continued Thursday

# Housing Baffles Johnsville

By JOSEPH DUNPHY  
Of The Inquirer Staff

Last in a Series

HALLENGING the seemingly impossible and winning is almost an everyday occurrence at Johnsville Naval Air Development Center.

Yet, after many years of research and testing, one problem still eludes the minds that oversee the installation — how to achieve an harmonious relationship with surrounding communities.

Through the years, two problems have gone unsolved: Housing for the center's 450 Navy personnel, and the fact that Jacksonville rd. bisects the center.

Johnsville has met unwavering opposition from Warminster Township forcing Navy men to live in deteriorated or expensive beyond means housing, and the security-sensitive center divided by a heavily traveled road.

Johnsville's commander, Capt. Frank W. Ewald, said he preferred not to renew the battle by talking about closing Jacksonville rd.

"Officially, the project has been held in abeyance," Ewald said of a plan to swing Jacksonville rd. around the western portion of the center.

Ewald said the Navy wants to close or divert the road for a multiplicity of reasons: security, traffic, communications and movement of fire equipment.

Township officials contend a new road would take valuable industrial land and mean loss of high tax acreage.

The Navy says the land taken would be along the Reading Co. tracks and involve little industrial acreage. In fact, the rerouted highway would provide access to the Camden Fiber Mills Industrial Park, west of the center.

The State Highways Department wanted to do the roadwork last year when they began widening Street rd. to four lanes, but the Navy,

bowing to township protests, backed off.

Ewald said the problem will have to be resolved in 1970.

"We have to press for an answer from the township on our proposals. Leaving the thing in the air is impossible, from a planning standpoint."

Improvements and expansion are in the works for the center, he added, as well as plans to move in several departments from Philadelphia Naval Base.

\* \* \*

THE biggest problem is providing adequate housing at rentals covered by Navy allowance for quarters.

The Navy is attacking the problem on three fronts: Getting

housing built on the base, as a long-range solution; extending the leased housing law, and developing a guest housing program.

Local officials say new housing at Johnsville would strain Warminster municipal facilities and schools, and thus increase taxes.

Johnsville has proposed a \$5.5-million complex to provide 300 housing units for married, enlisted men and officers, assigned at the center and at nearby Willow Grove Naval Air Station. Congress deleted this item from military construction bills in 1967.

Enlisted men would have been given lodging according

to family size and charged only their housing allowance.

Warminster protested that the township would have to finance the estimated \$360,000 cost of water and sewage facilities plus a school for an estimated 600 children in the complex. All that could mean a 1-mill tax increase despite Federal subsidies.

Ewald said each installation must put in its own bid for Navy housing, and competition is very keen.

"Whenever civilians are adverse to the housing," he said, "it virtually puts that installation out of the running with the other competition."

Ewald talked about a new concept of Navy housing.

"We look over commercial housing design in the local community and pick one out for the Navy personnel."

"This provides better homes for less money, and the housing is compatible with the community."

\* \* \*

JOHNSVILLE is not in the Navy's 1971 program for housing, the captain added.

Under the leased housing program, the government rents houses to military personnel and the housing allowance is given to the government.

Until December 1968, Johnsville had such housing, but the government ruled the center failed to meet base specifications for an extension of the law to cover Johnsville is being sought, Ewald said.

The guest housing program would provide motel-type accommodations at the center

while new personnel look for housing. Ewald said the men are now in a poor bargaining position, and are forced to take either poor or expensive accommodations for their families.

Another law under consideration, Capt. Ewald mentioned, would pay the quarters allowance on an area basis.

At present, a family man at Johnsville gets the same housing allowance as a man in the South where rents are generally much lower.

"This law would be a cheaper alternative to provide housing, than to pay military personnel on a level with civilians."

Ewald said present housing allowances make it difficult for men to continue in mili-

tary careers, since a large percentage of them have to moonlight to meet their bills.

But, while the center has had its differences with Warminster, it has given the township an array of services and contributions.

By opening its facilities to schools; Scouts and civic groups, providing assistance and speakers for local government functions and establishing scholarship programs, the center (Capt. Ewald was specifically cited in a Navy report for his attitude toward community relations) has gone a long way toward bridging communication gaps.

The Navy aims to have a harmonious relationship its surrounding communities. It plans to be around for a long time.