They're building up to a moon mission
A $3.5 million contract for construction of a tracked air cushion research vehicle (TACRV) was announced in June by Secretary of Transportation John Volpe. The tracked air cushion vehicle concept shows great promise for meeting transportation needs of the future. Volpe said, "I am pleased that we have reached the hardware stage where we can start testing to see if this promise is justified."

During the past year, with Director Bob Benito and Manager Greg Grube leading the TACRV team's efforts, Grumman and the Department of Transportation have been working together to develop the TACRV design. The contract represents a $3 million commitment between Grumman and the Department of Transportation. The TACRV design was delivered by Grumman to the Office of High Speed Ground Transportation on March 8. "This award is a significant step in our plans to generate new business in the civil sector," said Ron Spencer, Civil Systems Business Development manager. "Since March we have had temporary letter authority to construct the vehicle. It is being built under Foreman Frank Parkinson's guidance in Plant 4, and construction is expected to be completed by the end of March 1972. Tests will begin immediately on TACRV guideway at the Department of Transportation High Speed Ground Test Center, located at the Test Center in Pueblo, Colorado."

Testing of the research vehicle at speeds up to 300 mph will be aimed at gathering technical data required later on for the design of passenger-carrying (TACV) systems. Specific areas for testing will include the performance of air cushions, vehicle aerodynamics, ride comfort, linear induction motor and vehicle control power collection from the wayside power source.

Fundamentally the TACRV Program will determine the economic balance between vehicle sophistication and the guideway price to assure future operational systems. (The more sophisticated the vehicle, the greater the guideway cost, and vice versa.)

The nation's first linear induction motor (LIM) built by the Garrett Corporation for the Department of Transportation. For the research vehicle, three General Electric JT 15D-1 jet engines will provide both lifting air and sufficient residual thrust for over 100 mph speed. Later operational vehicles will use electrically driven air-supply fans, according to Raim Parkinson of Business Development.

Power for the LIM will be supplied from a wayside power "third rail" and two turbo fans will power the lifting air cushions beneath the vehicle, as well as the guidance cushions on each side. The nation's first linear induction motor design for speeds up to 250 mph is now undergoing testing in a vehicle at the Department's Test Center on six miles of track already activated. The LIM for powering the 300 mph TACRV is being designed and built by Allresearch Corporation.

Riding on air. Grumman has received a $3.5 million contract from the Department of Transportation to build a tracked air cushion research vehicle (TACRV). Vehicle rides on a thin layer of air in a U-shaped channel, as shown in painting by Craig Kavafes. It is being built in Plant 4.

Buckley cites defense needs

"Can any country not afford to defend itself?"

The rhetorical question was asked by Sen. James Buckley, Conserva-
vive, of New York, during a Bethesda luncheon given by the Long Island Association of Commerce and Industry late last month. Buckley's central theme was the need for a militarily powerful U. S. to keep the "balance of terror" internationally. He said: "The simple and serious facts are that we cannot afford to slip behind... . the Soviet Union much further without the gravest peril." He sees U. S. power deteriorating now "vis-a-vis the Russians."

He indicated that to fail behind the Russian effort "is to invite a tech-
nological Pearl Harbor."

Senator Buckley's speech also scorched what he called "mindless pal-
bable anti-militarism," and said the danger of an insufficiency of weapons is present. And he said: 

"As long as human nature is what it is (and) some nations are aggres-
sive by intent and history we need more and increasingly sophisticated weaponry."

The Senator spoke candidly of Grumman's F-14 Tomcat, calling it the only aircraft in sight capable of tangling with the Soviet Foxbat. He also spoke of Tomcat production cost growth, saying, "Let's face it. Anybody letting out contracts has been hit by enormous inflation. Inflation in the last analysis is caused by Federal mismanagement."

Instead of retreatment, "blind cutting back" of military budgets, he urged increased spending to meet "international realities" and declared that "We must also broaden the scope of our research and development of new and more exotic weapons."

So, unless military budget cuts were stopped and turned around, "it could result in drastic changes in American foreign policy and the inability of any American president to work to protect our interests abroad, whether they be in the Middle East or Western Europe or in the Pacific."

**Buckley cites defense needs**

**Riding on air.** Grumman has received a $3.5 million contract from the Department of Transportation to build a tracked air cushion research vehicle (TACRV). Vehicle rides on a thin layer of air in a U-shaped channel, as shown in painting by Craig Kavafes. It is being built in Plant 4.
GRUMMAN gets go-ahead for Hawkeye production

WASHINGTON, D.C. — The Defense Systems Acquisition Review Council gave the Navy and Grumman a firm production “go” for the E-2C Hawkeye on June 24 following a presentation by Capt. Joe Pariseau on the development progress on the plane. While the DSARC decision signals the start of production, involving a total of 28 aircraft over the next three years, full program funding will not begin until later this fall. The Navy has already provided Grumman with $43 million in long-lead time fund- ing for systems hardware.

The Defense Systems Acquisition Council Review had to evaluate the development of the E-2C to determine whether the systems hardware—radar, displays, etc.—were ready to commit to production. To do that, the defense council evaluated laboratory tests and flight data to determine the health of the program before committing the Government to the next development phase: full production start-up. These frequent reviews reflect the “fly before buy” philosophy of Defense Secretary Melvin Tom Guarino, E-2C program director for Grumman, noted that “This was one of the shortest DSARC’s in history. It’s a real tribute to the tremendous effort by the E-2C team—especially over the last six months—in preparing the Hawk- eye and its systems. We met some very tough milestones, 13 in all, while pre- paring this bird for the Defense Sys- tems Acquisition Review Council. DSARC was impressed by the effort, the performance of the plane, and the team—and so was I.”

The E-2C, a more advanced version of the successful E-2A and E-2B ver- sions of the Hawkeye, will have some rather noteworthy improvements: a new overland radar, updated computer, new radar displays, and a new inertial guidance system. They add up to a far more capable Hawkeye, one that can detect, identify, and track aircraft over land (as well as over water)—a very vital con- sumption to Fleet defense when U.S. surface units operate near large land masses such as Southeast Asia and the Mediterranean.

In addition to its early-warning mis- sion, the Hawkeye with its five-man crew is also an excellent intercept-control command post, and has even filled in on occasion in directing air-sea rescue missions. Besides adding up to an imposing new avionics “suit” for the Hawkeye, the new systems improvements are expected to increase reliability of the plane many times by reducing turnaround time be- tween flights, providing automatic prob- lem isolation in “blackboxes,” and mak- ing these systems easier to maintain.

Six months ago when Guarino was named E-2C director, he set three pro- gram goals: maintaining a very tight milestone schedule leading to DSARC; providing the Navy with a high-quality weapons system; and making a good overall profit on the aircraft for the Company. “We achieved the first goal with flying colors. Now we’ve got our sights locked on to the next two.”

Making detail parts

So the DSARC “turn on” has, in ef- fect, turned on various Grumman plants in starting up Hawkeye production. Detail parts—some 3,000 of them—are being fabricated for eventual delivery to Plant 36 where the E-2 fuselage will be assembled. Wings for the Hawkeye will be supplied by the Stuart facility in Florida, and final assembly and flight test work on the Navy’s new AEW plane will be accomplished at Calver- ton.

Last week, Captain Pariseau, the Navy’s program manager on the Hawk- eye, came to Bethpage to congratulate the E-2C team on its program win. And

Small Business award. Ellesof Manufacturing Corporation of Bohemia, associated by Grumman, was named Small Business Subcontractor of the Year for the New York-New Jersey area. At the award presentation recently were (L-R) Congressman Otis Pike, Mingo Logothetis, president of Ellesof, Carlos A. Villanuti, SBA’s region director (presenting the award), Sophocles Logothetis, and George Devine, Grumman director of Material. (Photo by Mario Trimboli)

Hawkeye gets ‘go.’ Capt. Joe Pariseau met with E-2C Program team members last week to offer congratulations on Government decision to turn on production of newest Hawkeye AEW aircraft. In photo above, Armand Lava, Pete Tyer, and Harold Allen are pictured in ‘back end’ of Hawkeye at radar consoles while preparing for test flight recently. (Top photo - Fred Aneff; bottom photo - Bob Soffit)
Venice Assembly visible sight—the entire Apollo is moved by John Boles. In it is all the frame pencil more than 360 feet tall. Stage by stage the sections are built up and at a pace of less than one mile per hour, to the launch site. Grumman, July 12, 1971

For the first time in a decade, traffic fatalities in 1970 declined. From a total of 56,900 persons killed in traffic accidents in 1969, the 1970 total declined by 1,500 to 55,200 persons, report The Travelers Insurance Companies.

Honor grads, select new groups for Professional Development

A luncheon honoring the first of Grumman’s 1971 Professional Development Program (PDP) graduates was given by the Company recently, with Administrative Vice President John O’Brien presenting certificates to the group completing their two-year PDP in Business. Others have completed their semesters in the Engineering and Manufacturing options. Working in PDP under the Manufacturing option are these recent appointees: Joe Burkowsky, in Operational Data Systems; Tom Conway, Product Support; William Cerniewski, Operations Planning & Budgets; William Rose, Product Control; Robert Rothwell, Product Support; Anthony Sans, Material; Otto Sauberg, Product Support; John Schneider, Engineering Associate Contracts; Louis Yevrek, Subcontract Administration.

 angels on high. The U. S. Navy’s Blue Angels returned to Long Island Independence Day weekend to thrill more than 100,000 people with their display of precise aerial maneuvers. After one of the shows, Norm Goeldner of Business Development (center, above), who flew solo for the Blue Angels a couple of years ago, chats with Lt. Jim Maukewill, the pilot in the Angels’ diamond formation, and Lt. Skip Ackerman, who flies for the Blues. (Photos by Fred Ansietis)
Preparing F-14 for 'stall' tests

After 367 flight hours in 18 separate successful flights—including five in-flight refuelings—Tomcat No. 2 is in lay-up in Plant 7.

During lay-up, the stall parachute to effect recovery will be installed. This, peculiar only to No. 2, is to help "level" the plane for flight, after it is deliberately stalled, and once that's done the 'chute is released.

Preparing F-J4 for 'stall' tests

It has flown, touched down, and climbed into the air again using mirrors. All four test pilots assigned to Tomcat thus far—Chief Test Pilot Chuck Sewell, Bob Smyth, assistant director of Flight Acceptance, Bill Miller, and Don Bayne—have flown the plane. They've found it performs well.

The aircraft has already made 68 "mirror approaches" and touch-downs. That is, it has flown, touched down, and climbed into the air again using mirrors similar to those aboard a carrier.

Tomcat No. 2 is designed for low-speed and stall performance tests. The aircraft has already made 68 "mirror approaches" and touch-downs. That is, it has flown, touched down, and climbed into the air again using mirrors similar to those aboard a carrier.

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No. 2 is scheduled to fly on the 26th.

Tomcat 1-X is to fly in the middle of the month. That plane's main mission is to expand the flight (speed) envelope. A secondary role, just as important, is to measure the aircraft's aerodynamic flutter/damping characteristics: shaking the plane in flight to assure that it's flutter-free and, therefore, safe to fly.

More records for Mohawk

Capt. Dick Steinboch and Chief Warrant Officer Tom Yoha are sitting on five unofficial world flight records they established with the Grumman OV-1C Mohawk last month and are probably wondering if there are any pilots around to dispute their claim. The two Army officers from the 293rd Aviation Company at Fort Hood, Texas, piloted the Mohawk to three time-to-cimb speed records and two altitude marks while establishing records for Class C-1E, Group II—an aircraft group comprised of turboprop planes weighing from 6,814 to 13,277 pounds.

The records (all unofficial at present) set by Steinboch and Yoha: time-to-climb—3,000 meters, 2 minutes, 30 seconds; 6,000 meters, 5 minutes, 35 seconds; 9,000 meters, 10 minutes, 55 seconds; sustained altitude for 90 seconds, 36,900 feet; maximum altitude, 39,500 feet.

In 1966 another Grumman Mohawk set five flight marks for turboprop aircraft between 13,507 and 17,636 pounds. Army Col. Ed Nielsen, Lt. Col. C. A. Houseman as commanding officer of Marine Composite Reconnaissance Squadron (VMCJ-1). Colonel Eisenhauer was awarded eight Air Medals and a Navy Commendation Medal for Vietnamese service.

And for the men of VMCJ-1, Iwakuni, Japan, may not look much like home but it's a good bet that they look upon it with a helluva lot more enthusiasm than they did in their last base of operations. That was in DaNang, South Vietnam. The Marines flew their last combat mission in South Vietnam just about two months ago, and the distinction for closing out Marine jet operations in that area went to an EA-6A Intruder crew, Capt. C. B. Lockett and Master Sgt. S. A. Gill. They flew the Intruder electronics countermeasure aircraft on May 7 in support of Air Force and Seventh Fleet planes. It was the final combat flight for Marine jet aircraft in Vietnam.

Hydrofoils in Navy's future

Grumman was host last month to Dr. David Jewell of Naval Ships Research & Development Center, Lt. Chuck Ruben of NSRDC, Hydrofoil Program officer, and Jesse Biroway, NSRDC Hydrofoil Mission manager, visiting Grumman's facilities to be used for designing and building the next generation hydrofoil.

Grumman's 15 years of hydrofoil experience and its whirling tank installation for foil research in Plant 12 seem to augur well for Company participation in the next phase of the Navy's hydrofoil program.

The Grumman PGH Flagstaff, a full-size gunboat with six-inch howitzer, recently demonstrated its stability and speed in excess of 40 knots in a month of uninterrupted gunnery trials off the West Coast. Joe Barcellini, Business Development notes that the immediate plans of the Navy are for a patrol hydrofoil guided-missile ship—"a next generation hydrofoil." Known as the PHM, it will be larger than Flagstaff (120, as compared to 75, feet) and will be armed with surface-to-surface missiles and an anti-aircraft battery. A Phase I design study will probably be awarded by the Navy in early 1972—

Hydrofoils in Navy's future

and Grumman intends to be right in there.

Long ago and far away

Remember Steve Eisenhauer, two-time All-American guard from the Naval Academy? He earned that distinction in 1952-53 and graduated from the Academy in '54. It was Lt. Col. Steve Eisenhauer now, and just recently he succeeded Lt. Col. C. A. Houseman as commanding officer of Marine Composite Reconnaissance Squadron (VMCJ-1). Colonel Eisenhauer was awarded eight Air Medals and a Navy Commendation Medal for Vietnamese service.

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LM in Smithsonian exhibit

To borrow, somewhat literally, from a current ad, "When you see Smithsonian you've said it all."

For the Smithsonian Institution is one of the nation's premier museums as well as a research center. And what's there now should interest every Grummanlite: a mockup of Lunar Module No. 5, the vehicle that Neil Armstrong and Buzz Aldrin used in Man's first manned landing on the moon.

LM-5 is nophony vehicle. Actually, it's a reconditioned LM-2. No. 2 was originally scheduled as a backup vehicle for LM-1, but No. 1's flight was so good that the program skipped over No. 2 and went directly to No. 3. So that opened the opportunity to re-work No. 2 to make it an exact copy of the vehicle that first landed on the lunar surface.

That in itself makes it a prized possession of the Smithsonian. But there's a little extra involved, as mentioned by Frederick C. Durant III, assistant director of Astronautics at the Institution:

"It is rare that a museum has the opportunity to exhibit historical items such as the LM while they are still making history. The Lunar Module now takes its place among the other great artifacts of our aerospace heritage."

"On July 15, there'll be a formal dedication ceremony at the Smithsonian. And as the new LM-5 sits in its place of distinction, a reminder of what can be done, you can look over its shoulder, so to speak... to LM-1B, due to land on the moon July 30.
KENNEDY SPACE CENTER, FLA. — In just 14 days (July 26), Apollo 15 is to be launched, and things are “go” for the flight that will place the men of LM-10 (Falcon) on the Hadley-Apen-nine area of the moon.

The current schedule calls for Falcon to be prepared for countdown preparations. After another inspection, the final countdown will begin. On the 26th, the earth-shaking force of the Saturn V rockets will push Apollo away from its launch pad and toward a lunar course; only very bad weather will prevent the launch. All is in readiness.

The Grumman LM team at the Cape “is as finely tuned as any we’ve had, and maybe even better,” says Wiley Williams, who is the manager of all LM operations at KSC.

Williams is a man not given to overstatement. Nor is his view parochial. He’s seen both worlds—the National Aeronautics and Space Administration from 1960-1966 and Grumman since then. He appears to have an almost instinctive “feel” for both people and organization. He speaks warmly of the “atmosphere.” It’s a sense of bullpens: I try to break things up into small units so the individual has relative privacy and freedom to work. . . . It all comes down to a good work atmosphere.”

As Williams points out, this kind of informal structure is hardly unique; many other organizations function in much the same way. But he’ll mention, too, that there are solid benefits in productivity and esprit de corps when a simple, direct organization. . . . A minimum of redundancies in staff . . . Visibility . . . Accessibility . . . An absence of bullpens: I try to break things up into small units so the individual has relative privacy and freedom to work. . . . It’s a real test of cooperation, doing things right—as I say, like an orchestra leader.

“About 50 people are involved in this three-shift STM operation. Our time schedules are nailed down to the minute. They have to be because we’re dealing with six other major contractors: We can’t infringe on their block of time, and they can’t put ours out of whack. It’s a real test of cooperation, doing things right as I say, like an orchestra leader.”

That’s how the place really functions.”

All for Falcon. Activity at the Kennedy Space Center revolves around Lunar Module 10 (the Falcon) for the flock of Grummanites stationed at Bethpage.
Chuck Kroupa praises
team effort at Cape

Grumman's director of Operations at the Kennedy Space Center is Chuck Kroupa, an intense man with 25 years in the Company and a quiet faith in his people and the job they've been doing on Lunar Modules.

For him, teamwork is not an idle slogan but the prime requisite in getting the job done. And "the team" encompasses everyone, not only his people at the Cape but all of the others who deal directly and indirectly with them.

"I think in terms of the total team," he says. "You have to 'see' all of them, the Grummanites here, at Bethpage and Houston, the NASA people, and all of the contractors who have inputs to the LM."

If teamwork is the principal element in the LM effort, then running a close second for Kroupa is a phrase he keeps repeating: "meticulous attention to detail." He says "you can't overlook anything. You check things, and then you check them over and over again. You have to if you want to be sure—and we have to be sure."

This insistence on accuracy and follow-through may be a character trait "built in" at birth, or as a result of experience (such as 10 years of flight-test work and service with the Air Force in the '40s), or both. It really doesn't matter, in a sense, for whatever the origins, the attitude is there, and apparently unshakeable. It has stood him in good stead in the Air Force, through 10 years in aerodynamics, and four years as assistant base manager under Vice President George Skurla, who headed up Grumman operations at the Cape until this past year.

In fact, many see a close similarity between Skurla and Kroupa—intenseness, drive, thoroughness and a deep concern for his people. One doesn't sit long with Kroupa without learning how much he values his staff.

"I'm most impressed with the integrity of all of our people, the long and hard hours they've put in perfecting LM, and the way they pitch in and help one another."

"Communications are good, and the logistic support from Bethpage has been excellent," Kroupa continues. "That's all attributable to our people. They're the best in the business!"

With that type of endorsement, Kroupa must feel confident about the Apollo 15 LM-10 flight. "Yes, I do," he said. "We've got a good bird here. We expect it to perform well. We know that this is going to be the most difficult LM flight so far. Instead of coming in for a lunar landing at about 16 degrees, as the others have done, Falcon will come in at approximately 25 degrees and land after passing over a high mountain.

"Then there'll be three EVA's, one of two hours and 25 minutes, a second of five hours and 31 minutes, and a third of four hours and 33 minutes. By using the Lunar Roving Vehicle, the astronauts will be able to travel about a total of 22½ statute miles. That significantly increases the length of any previous lunar traverse."

"Also, something really new has been added. A TV camera mounted on the LRV will be stationed some 500 yards from the landing site and actuated remotely from Mission Control Center, Houston, to take photos of the ascent from the lunar surface."

"Yes, Kroupa is positive about the mission . . . and so is the team."
Vosefski detours Road Runners

There is such a thing as economy of effort, but what Joe Vosefski did the other evening is stretching things a bit. Pitching for the Monopoles in the Monday 1969 and '70 seasons, the Duck surprised everybody (including them selves) in the Monday night loop by copping their first two tilts of the year. But, that's where the story ran off. LILCO bombers hit the 13-0 in the last game to grab the title for the first time. Joe Stalza played every inning in the tourney, fielded flawlessly and batted .370. Selected on the tourney's all-stars from Grumman were Joe Carlu- zion, Hal Manaskey, and Don Lundergan.

Oldtimers still going strong

Talk about longevity. A little more than 30 years ago, Frank Jagilello was zipping his fast ball across the plate for the Grumman Yankees, helping that fast-pitch squad capture a couple of Mid-Atlantic titles along the way. Now Frank's teammate, Charlie Selock, who has been on the plate for 46 years, is a member of the Old Timers. No snickers, please! Frank and the rest of the Old Timers just wrapped up the first-half crown on 13-0 and 3-0 wins over the In- vaders and Flight, respectively. Jack Caulfield and Tony Bolomey provided the batting punch, and the guy who threw the 3-0 win was another old timer of Pennine fame, Stan Mostak. . . . In the Plant 5 night circuit, the 9-CATS clipped the Hostlers (sic) 14-5 as John Lampasse collected four hits and Tony Dolecek flipped two triples and an inside-the-park homer.

Times were about even-up for the Boppers during a 13-2 loss to the Soul Brothers Plus in the Wyandanch loop. They made eight hits—and they made some noise. With the outcome settled at 6-1, Nino,Virtori, and Pete Vietritti, Mickey Rowles homered, and Bill Foote applied the first shaft, 7-1, as Charlie McLaughlin and John Lisa provided the batting punch. . . . Later, the Stars edged the Supporters, 15-12. And for those who would have given a farthing for the Jets' chances after they fell behind, 10-0, to the Whiffles, it assured the Brothers of an easy victory.

Veech! Simulation smacks Bed Guys

The Bay Guys must have been hallucinating when they selected their name. Some bed guys are really tough and tough, but the ones in the American division of the Tuesday-after-hours loop had better start taking ugly pills judging from the 19-1 shellacking they got at the hands of the Platers. One of the best efforts was made by Dave Carioli of the Whiffles, who hit three home runs in a 38-5 victory over the Bay Guys, as Joe Nieves and Frank Prisco smacked home runs, and Jim Zimritz, Joe Nieves, and Paul Havita hit triples. The win pushed Simulation's record to 4-0 in the loop. . . . After an 11-1 win over ILS, it looked like the Woodpeckers were on their way, but the Mets ended that streak the next week with an 11-10 win. Don Ruffaldini and Bob Oliveto added league wins. The Vikings drove that shaft a little deeper the following week with a 15-4 victory. . . . The Whiffles win, and they like it

End of the line

The string ran out for the Grum- man Intruders in the final game of the Rhode Island Invitational Tour- nament held at Providence a couple of weeks ago. Going into their fourth straight tournament title, the Intruders picked a tough way to accomplish it. They lost their second game in the two-de- fends-and-out tourney, went on to win six straight games to qualify for the finals, and then edged LILCO 1-0 to set up a head-to- head meeting for the crown.

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Tee varsity tops

three L.I. teams

While running off three straight victories in the L.I. Industrial circuit, the Grumman guns Idaho 4-3, 3-1, 5-0, to clinch a bit of a scare two weeks ago before edging LILCO, 4-3, 3-1. Steve Gray and Jim Alaimo whiffled their way through the first two, then LILCO and Blackbirds took over. Gray and Alaimo, it assured the Brothers of an easy victory.

Selock sparks golf circuits

There's a lot of symbolism going for Charlie Selock, foremost, Central Rece- iving, Plant 24. . . . In the first place, he golfs in the Lunar Links League, an indication of just how far up and away those mortals are. If this isn't enough, he's a member of a team modestly called the Aces. And to prove that Charlie's in the swing of things, what does he do? For true: He flew an ace.

That's really overdressing it a bit. It all happened on the Hauppauge course, on the par-3 145-yard fifth hole. Of course, the area was been well mark- ed out for him: For in this foursome, Jimmy Nelson teed off and put his ball some eight feet from the pin, Tony Cartolf left one 12 feet away, and Chuck Warren was 35 feet away. Charlie surveyed the scene, drew out a 9 iron, and stroked the ball . . . up, . . . and on one bounce that white pellet dropped plank in the hole. After 21 years of trying, Charlie got his see.

Herman stands out

John Herman had a hot iron in his hand during recent play in the Program Management loop at Hauppauge Country Club. Herman signed in with a 38 and 39 (par is 36) in the last two sessions, while Cliff Miller shot 39. First-half medal play winners were Charlie Wei- neseker (Flight A) and Woody Bun- setti (Flight B).

VITALS lead runners

In the Runamuck league, Carmine Vitale paced the field with a 46 over the first nine holes of the Green course at Bethpage State Park. Tom Toner, two strokes back, chipped in a birdie-2 on the second hole, and halved the hole, while Roy Kradzinski registered 43 for the round. Joe Sherry's 40 for nine on Dix Hills stood out in the Business Office golf circuit. . . . Winners in the KDP loop's first-half tourney at Bethpage included Joe Mazzarella, George Burmeuser, George Capua, and John Malone. Long- drive: Lew Simpson, closest in pin, Bob Kelly.
Communications reports big savings using leased phone lines

A study of Grumman WATS (Wide Area Telephone Service) shows clearly that WATS leased circuits save the Company substantial money—more than $371,000 for the month of May, for example, as compared to what conventional long-distance calls would have come to over the same period. "The saving could have been more, though," says Tele-Phone Service Manager Al Zoltie, "if everyone had used the WATS to full advantage. For example:

"Always use WATS to call the western states listed on page IX of the Grumman telephone directory.

"Before 11 a.m. local time, WATS can be used to call all eastern states except New York. Schedule your calls to take advantage of this.

"The average length of a WATS call is now 1.7 minutes. If the length of a call were reduced to 4 minutes there would be no wait for a WATS trunk. Prepare your information before you call, and limit your conversation to business."

"Fun glasses" protect eyes against ultraviolet and infrared rays.

"Be patient when trying to reach a WATS (56) trunk. The easier way (conventional toll lines) is the expensive way."

"For additional WATS information, see page IX of the Grumman directory."

On target. Grumman Gophers, perennial champs of L. I. industrial league, retired another 'Jake' Swirbul Memorial Trophy for 1971, their third in four years. Playing at the recently refurbished Garden City Country Club, the boys bested the mailing listLM team 294 to 152. Team members are Bob Lang, Al Adler, Hans Fotsch, Al Burns, Joe Russak, Hank Womble, Ed Brandis, and George Hilton. Also on the squad are Joe Anckner, Gordon Groenewold, Dick Ingram, and Harry Shutes.

**KSC team awaiting launch of Apollo 15**

(Continued from page 6)

The method and the story almost repeat themselves elsewhere, as in Dom Pastore’s Quality Control section of about 125 people. ‘Anyone who’s in QC,’ says Pastore, ‘works in a haloheel. You can’t hide a thing; that’s the last thing you can do. After all, you have to protect the astronauts, and in doing that, you have to check on all hardware and procedures. Everyone’s right out on the table, where everyone can see.

‘That makes us—like others—a close-knit group. In addition, we work on cross-pollination of ideas. A KSC man goes to Bethpage and vice versa and we bounce ideas off each other. That way, we don’t stagnate, we’re always in motion. I think it’s paid off on the job, and I think NASA notices it, too.’

Perhaps an outsider (or even an insider) would see this cooperative intertwining of skills and teamwork best, maybe most dramatically, through the work of Grumman’s three KSC consulting pilots. As George Dowling, who heads the crew, explains, ‘Professionally, we look at the LMs in a different way, with an operational flight crew attitude. We’re the alter egos of the astronauts and we view the process just as though we were making the flight. We look at the hardware; we look at every subsystem; we analyze the particular LM’s characteristics, for each one is a little bit different from any other. On top of that, we try to evaluate each significant item in terms of its possible impact on a flight. For instance, we ask, how would this or that affect me if I were the astronaut? By looking at it that way, we try to eliminate all the little things that might bug the crew.

No surprises

‘Of course, this isn’t just a train of imaginings. We work directly with the real article and compare the real flight item with what is being used in simulation by the astronauts. If the real thing differs from the simulated item, we naturally advise the astronauts. We can’t let them be surprised.’

Everything that’s gone before—the checking and rechecking, the testing and retesting—points toward the same end: preventing surprises for the astronauts actually flying the mission. Or, to phrase it differently, the job is to make a LM flawless.

Thursday the 24th’s FFR (Flight Readiness Review) was just about that—almost flawless. The glitches that showed up were few, and all were easily correctable. And Peg Hewitt (among others) at the ACE station in KSC, now thinks about the prelaunchdown at T-123 hours ... and later, the countdown beginning at T-102 hours with built-in holds.

It seems that all is well; everything set for “go” on the 26th ... and some may experience a twinge of excitement. Those who are ‘on top of the program,’ so to speak, seem as thrilled as they were during the first moon landing (though they conceal it). People like Jerry Gold- marcher, for instance: Whether at KSC or Bethpage, Jerry, who is director for the Roving Vehicle, makes mistakes convincing cool. He smiles and simply states history: Each LM has been followed by an even better LM. Sure, the coming mis-

**Flight crew**

Coming up in the last days of July is the longest and potentially the most fruitful Apollo-LM mission of all so far. As Bill Wordeman, Command Module pilot, circles the moon, David R. Scott, Apollo 15 commander, and Jim Irwin, LM pilot, will not only walk but they’ll ride in a battery-powered Lunar Roving Vehicle, making it con-

F "Fun glasses" protect eyes against ultraviolet and infrared rays. More difficult to land the LM because there’s a moon mountain almost as high as Pike’s Peak that LM must pass over. More difficult because there are three Keywords on the list this time instead of two, and mission length has ex-

**Counseling for vets**

If you’re a veteran and if you have questions concerning VA loans, insurance, benefits, or the like, you’ll prob-

**Fun or sun glasses?**

You behind those sunglasses—do you suspect they aren’t really as good as they ought to be? Check these pointers from Bausch and Lomb, well-known manufacturer of lenses:

The lenses should be precision ground and polished, and since plastic cannot filter out infrared rays, optical glass is necessary for complete eye protection. Properly formulated, it eliminates both ultraviolet and infrared rays.

Lens color for best color perception and least color distortion is neutral gray or sage green.

Prices for quality sunglasses start at about $10. Be sure the manufacturer is reliable.

Clip-on sunglasses add extra weight and do not give adequate coverage. A good frame has earpieces with metal cores to allow bending them for comfortabe fit.

Polarizing sunglasses, favored by fishermen and sailors, are available at about $30.

"Fun glasses" protect eyes against dirt and wind, but not against glare from the sun, on bright cloudy days, on the beach, or for outdoor sports when maximum vision is needed in bright sun-

GRUMMAN, July 12, 1971

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**WASHER:** Westinghouse fully auto., $25. WE 1-2567.

**CHEVROLET:** '70 Nova SS, 396/375, blk., cust. cushions, Hurst, precision, Lakewood bars, Crowler

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**MISC.:** 3 bar stools/kit, counter stools, beige & black, ask.

**BARRACUDA:** '70, wh., blk. vinyl tp., air cond., pwr. alum. intake valves, posi, alarm, hook locks, slicks, cab. bind. md., $25. 681-9588.

**BOAT:** '61 Ulrichson flybridge sportsfisherman, 210 hp Johnson, jet, blt. vinyl, fender, cuddy, radio, 2 depth find., eng. synch., te

**AIR COND.:** Chrysler Air Temp., '70 Imperial, 6,500 ctr. foyer, beam, din. rm., panel. den, true brick anchor & line, dock lines, cush., life preserv., save

**PY:** 8-3869.

**HOUSE:** Hicksville, 3 bdrm. Cape, fin. bsmt. w/sep. gar., bsmt., xtras, low $30s. CH 9.8777.

**HOUSE:** Plainview, 7 rm., 3 bdrm., 1½ bath, fin. bsmt., appli., carpet., firepl., centr. air cond., fin. bsmt., appli., carpet., firepl., centr. air cond., s-s, w-w, 4 appli., 7,000 ml., $1,900. 931-5990, evgs.

**HOUSE:** Farmingdale, 6 rm. corner ranch, ctr. hail, 5 sticks, bridge & rack, ask. $28,900. 665-3943, after 5.

**HOUSE:** Bethpage Estates, 3-5 bdrm. hi-ranch, cul de sac., prime location, 520 sq. ft., 1 mo., $39,900. WE 8-2804.

**HOUSE:** Wading River, 9 rm. Cape, attach. gar., 1-2 bdrm., 2 baths, 4,000 sq. ft., fully equip., in water. MO 5-3357. 5.

**HOUSE:** Huntington, 3 bdrm., 1½ bath, fam. rm., den, breezeway, sundeck, 75x130, $33,500. AN 1-9389.

**BOAT:** 11½ ft. 6 in., hollow fbgl., w/skeg, blue, motors, bkt. top., fender, sissiy rail, Z bars, 2,700 ml., just

**DINETTE SET:** 48 in. octagon stone tp. tbl. w/wide

**MOTORCYCLE:** '70 Kawasaki Mach Ill 500, cust.

**BOAT:** 30 ft. Egg Harbor, new twin 125 Chryslers, start. alternator, will demon., $700. MO 1-3648, 9294021.

**CAMERA:** Konica auto 5.2, f 1.8, warr., $65. 212 5259,, after 6.

**FORD:** '69 LTD hdtp., full pwr., red & blk. vinyl
cloth, sissiy rail, Z bars, 2,700 ml., just

**OUTBO.:** 35 hp, '64 Mercury w,ttank & controls, ready, good shape, $150. 767-5484.

**PE:** 5-3357.

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Slip into your esmackers, round up the family, and head for the corral at Calverton. Saturday, July 17, is the date for Grumman’s big annual outing, famous these many years as a safe and sane way to entertain the children for a day. Pay $2 if you’re over 12; the under-12s come free.

Don’t forget that tickets must be bought in advance. None sold at the gate.

That’s just the start of the bargain outing. There will be hot dogs galore and oceans of free soda pop, milk, and ice cream. Dad can have his nuts in a cup, or even in a pitcher if he plans it right—and if Mom wants to vary the menu, they’ll bring along a grill and an ice bucket and live it up while the kids race around and ride to their heart’s content.

Tickets: They’ll be on sale right to the closing of the night shift on the 18th. Remember, none are on sale at the gate. Only Grumman employees and their immediate families are eligible, with this exception: A single employee may bring a girlfriend or boyfriend as guest.

New routes
Picnic-goers from south shore or mid-island areas found last year that the Long Island Expressway got them to the picnic site in fast time. Now that exits beyond 68 are open, the distance seems diminished. Take Exit 69, Wading River Road, Wading River. It takes ¼ mile you are at the entrance to your day of the Year. Where else can you get your ticket stubs. Any postponement will be announced early on Saturdays. Following the over the following Long Island radio stations: WLIJ, Garden City (FM 92.7); WGBB, Freeport (AM 1240); WHLI, Uniondale (AM 1100); WABC, Baby

D’Errico said last week ticket sales were shod of last year’s and he is predicting a big crowd. So gather up the family, bring the sun tan lotion and portable radio, and make it a Day of the Year. Where else can you enjoy so much for so little?

Just in case
In the unlikely event of rain on Picnic Day, the outing will be held on Sunday, July 18.

Got an idea?
Summer’s here and all approved employees suggestions handed in to the Corporate Suggestion Office during July will receive double Flight Shop certificates, good for a minimum of $8 worth of Flight Shop merchandise. So “write it up, send it in, in July.” The better the idea, the bigger the opportunity to earn awards.