EDITOR'S NOTE: One of civil aviation's real success stories is that of the Flight Service Station system, which this month is celebrating its 50th anniversary. The problem in telling this story is that the system's achievements are so broad—dating back to the early air mail radio stations—and its activities so far-flung. The PILOT *decided to concentrate its coverage commemorating this event upon an area where some of the first stations were installed and the flight assistance was so vital. We are referring, of course, to the mountain areas of the West. Mr. Downie was fortunate in being able to talk to some of the men who were present at the beginning. We believe you will find this article most interesting.*

First Fifty Years Of FSS

by DON DOWNIE / AOPA 188441

AOPA PILOT's Western Editor

Beginning of Flight Service Station system linked to transcontinental transportation of air mail. Present 340 installations now devote major attention to general aviation flights. 'Oldtimers' tell how it all started

■■ "Elko Radio, this is One Four Nine, VFR Reno to Elko, five west. Close us out, and landing advisory please."

"One Four Nine, this is Elko Radio. Flight plan closes at zero seven. Designated Runway 23. Wind light and variable. Altimeter 30.07. No reported traffic."

One Four Nine skims across town on final, touches down on a field that has been an active airport for 50 years, and taxis up to the line. Everything is pretty much routine. The new "low profile" air/ground console at Elko FSS permits the specialists to handle communications and still keep an eye out the window to give factual airport advisories.

Back in 1920, when Elko, Nev., was one of the first key stations on the transcontinental air mail service, things would have been slightly different. A surplus arc radio telegraph would have sent a message to Salt Lake City, stating briefly, "Smith #249 arrived 4:10," and signed by the field manager. In the case of Elko, normally only a refueling stop, it would have been a brief arrival/departure message.

The FAA, which now has 340 Flight Service Stations in 50 states, celebrates its fiftieth year of service this August 20. There's an interesting history behind this service that we take so much for granted today.

When the Post Office Department decided to fly the mail on a transcontinental route, a string of radio stations was begun that August, 50 years ago. The western section included Omaha, North Platte, Cheyenne, Rock Springs, Elko, and Reno, with arrangements made to use the Navy radio station in San Francisco.

Historical experts in the FAA state that only four of the original transcontinental chain of stations have remained "pure communications stations" for their entire 50-year history. The others have been combined with towers at one time or another, been out of service for periods of time, or otherwise had a change of operation. The four "pure" 50-year-old communications stations are Washington, D.C., Rock Springs, Wyo., Salt Lake City, Ut., and Elko, Nev.

The first FSS in Elko was a one-man operation. Most radio operators were ex-U.S. Navy veterans of World War I. The primary qualification for employment was to send and receive 30 words of code per minute.

Elko's first predecessor of the FSS was located in a 20 × 20 building near the Humboldt River. Local folklore indicated that the building was still standing and currently in use as one of the town's legalized parlor houses. This makes a fine story, but unfortunately it isn't quite true.

Confirmation of the location of Elko's pre-FSS came from Jess Harris, who "used to hang around the station as a kid." Jess freely admits that he aided in the disappearance of a couple of five-gallon cans of alcohol (doped with potassium permanganate to eliminate the possibility of human consumption). The alcohol was used to maintain the arc on the old two-kilowatt shipboard-type transmitters.

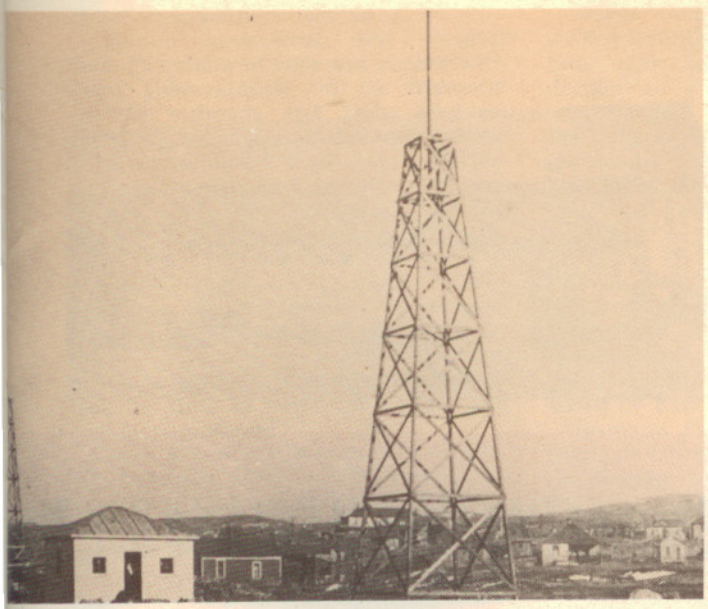
"We always picked up two cans of alcohol with a truck to drive them out to the station. Sometimes one of them would get lost," Harris grinned shyly in retrospect. "We found that we could take a copper radiator line from a wrecked DH Liberty engine, wrap it with asbestos and safety wire to form a coil, and then heat it with a blowtorch to distill the potassium out of the alcohol. That stuff was really potent. I believe that one Coke bottle full would get the whole town drunk!"

Jess Harris, frequently referred to as "Juice" by the early air mail personnel, is now the county sheriff, as was his father before him. Jess still flies a Cessna 180 and *Super Cub* to chase cattle rustlers. It was Sheriff Harris who discounted the rumored colorful location of the first Elko radio station. However, it was located at the far end of "the street."

The original reason for having transmitter stations located away from the airfield was to keep low-flying aircraft, groping for the field in bad weather, from hitting the antennas.

The radio operator had to be a jack of many trades, and an expert in improvising, to keep his equipment on the air. The job was seven days a week and frequently before dawn, when the operator would exchange weather information with adjacent stations and relay this to the airfield. When the plane (Elko had one plane each way, each day, to begin with) took off, there was a departure message with the pilot's name, the ship number, and the number and weight of mail pouches. When the evening plane came in, the process was repeated. At division points, like Salt Lake City, a daily report was forwarded to Washington, and the operator had to stay on duty until it went out. Starting pay was $1,800—per year.

Many of these early stations were installed and improved by Art Johnson, a near-legendary radio operator who is



Metamorphosis Of A Flight Service Station

(Upper Left) This is said to be the first FSS, located at Rock Springs, Wyo. Equipped with radio-telegraph transmitters (usually two-kilowatt arc) these early Government stations communicated with air mail planes which then were going into operation. In their spare time, the stations handled communications of other Federal departments. With an arc transmitter, the highest possible antennas were installed. *FAA photo*

(Lower Left) Entrance to the early Rock Springs station, and the station's crew. Note the sign above the entrance. The Lighthouse Service, Airways Division of the Department of Commerce, was the first operator of the communications service. *FAA photo*

(Upper Right) Interior of the Rock Springs Station today. An FAA Queen Air is watched from the "low profile" station configuration as the plane taxis out. *Don Downie photo*

(Lower Right) Site of the first "airport telegraph station" is inspected at Rock Springs by Lee Warren (left), a top official of the FAA's Western Regional Office at Los Angeles, Calif., Dale Heister (center), chief of the Los Angeles FSS, and Cliff W. Wheeler, chief of the Rock Springs station. *Don Downie photo*

very much alive in Santa Monica, Calif. He ran his first amateur radio station in 1911 (at age 12), before there were any licenses, and had a call-sign of 9AL a year later.

Johnson joined the U.S. Navy prior to World War I and spent nine months at a Navy electrical school. "It was a darned good program," he commented. "We had both theory and maintenance courses so that we could keep our equipment on the air."

Johnson explained that the original Post Office Department concept was to develop both communications and navigation systems for modified twin-engine bombers with radio operators aboard. About May 1920, pilot Wesley L. Smith flew from College Park, Md., to the Philadelphia Navy radio station "without regard to compass or ground indications, using a receiver with a fixed-loop antenna."

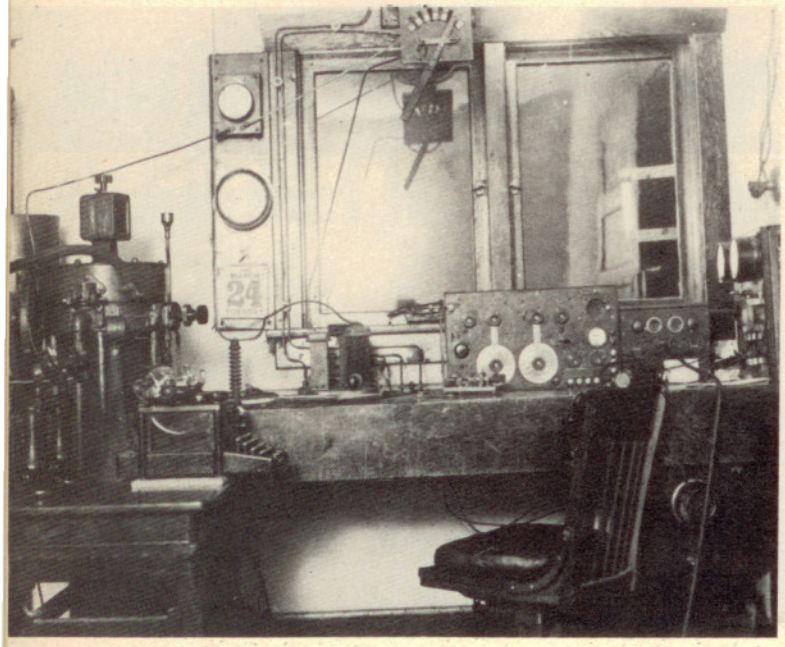
When the surplus single-engine DH-4s came into general use, there was room for the pilot and all the mail he could carry—but not for a radio operator. So the idea of both "nav" and "com" was discarded for a time, and the first wireless stations were used strictly for communications, to replace leased telephone wires.

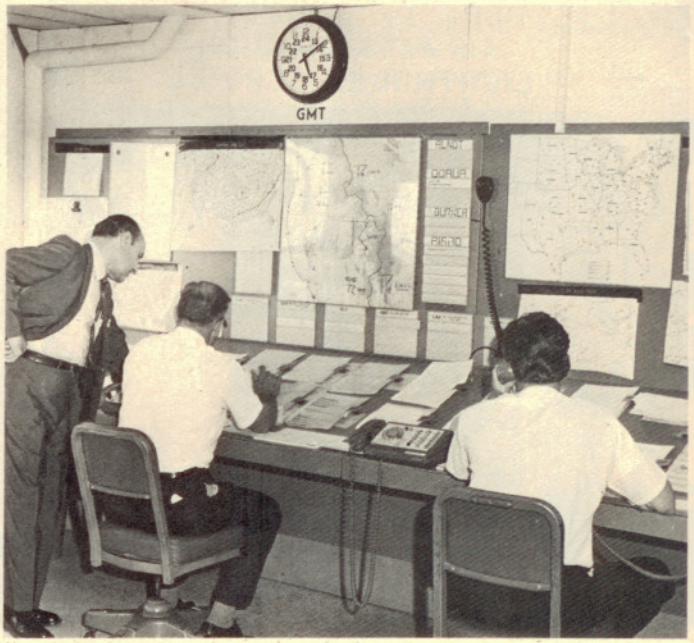
There's a station log at Elko named "The March of the Idiots." Art Johnson reported that Elko was then the least desirable place on the entire transcontinental route. All the new men first went to Elko. One newcomer got off the train in Elko, looked around, and climbed right back aboard for parts unknown.

Present Elko chief is Howard Griffith, who moved here more than two years ago from what must have been an even less desirable post, Bryce Canyon, Ut.

When you fly along this mountainous No. 1 air mail route, it's easy to marvel at the pioneers who built this system from almost nothing. The original "com" building in Salt Lake City was on the fairgrounds, but the first airport structure, completed in 1924, still stands as a lean-to on an old United Air Lines

Changes Take Place At Salt Lake City, Too





(Upper Left) One of the first homes of an FSS predecessor, the Air Mail Radio Station in Salt Lake City, Ut. The picture was taken in 1920. *FAA photo*

(Lower Left) The Salt Lake City Air Mail Radio Station operated this "modern" communications equipment in 1925. Key components are a two-kilowatt arc transmitter (left), wave-change switch (upper center), and "bug" type transmitting key in front of the high-frequency receiver (right center). *FAA photo*

(Upper Right) An early FSS building at Salt Lake City is now a "lean-to" on a United Air Lines hangar. *Don Downie photo*

(Lower Right) FAA's Lee Warren receives a briefing at Salt Lake City's present-day Flight Service Station. *Don Downie photo*

hangar. It was here that much of the early cut-and-fit developmental work took place to put more punch into the surplus equipment.

Art Johnson recalls, "During heavy atmospherics, signals from the arc transmitters sometimes failed to get through. Phil Coupland and I developed a means of raising these two-kilowatt transmitters to five kilowatts by enlarging the power supply, installing larger field coils, and improving both air and water cooling. We used a 17-gallon Liberty radiator, mounted outside the building, to cool the water.

"We also developed a wave-change switch that would operate without shutting down the transmitter.

"We got jolts all the time," commented Johnson gingerly. "They'd burn, but they weren't dangerous. Sometimes the air and alcohol mixture would explode. We could have used a kerosene mixture, but that would have produced carbon around the arc. Those Navy arcs were almost foolproof—clumsy but rugged.

"The next year, Hadley Beedle (in Reno) and I (in Salt Lake City) began experimenting with vacuum tubes operating at short-wave lengths. Hadley developed a convenient transmitter utilizing two quarter-kilowatt tubes and a raw a.c. power supply, while I completed several working models along similar lines. His model had certain advantages, and he installed it in Reno and Sacramento while I built and installed similar units at all stations between Elko and Iowa City.

"All this equipment, including receivers, was built in spare time while we were standing a regular radio operator's watch. We had little or no money for the project and had to improvise in every way we could. Discarded half-inch copper gas lines from Liberty engines were used to form induction coils. Condensers were robbed from Navy spare parts. Discarded half-kilowatt powerline transformers were purchased from the power company for about $2 each and provided high voltage for the tubes.

"Most of our spare parts came from the Navy by the back door. Many of the Navy personnel working on the air mail circuit in San Francisco wanted to come to work for the Post Office Department, so we had little trouble in getting surplus supplies."

No one bothered about patents in

those days. Johnson has none.

Johnson considered the Phillips Code (a system of dots and dashes with many abbreviations, set up originally for the railroads and press releases) superior to the International Morse Code, particularly when static interference was in the air. The air mail system was the only organization to use the Phillips Code for regular communications.

"That's where 'CAVU' came from—and many others," Johnson commented. "A good operator knew all the abbreviations and could keep ahead of the guy on the other end, particularly when he took the time to write out 'ceiling and visibility unlimited.' "

Other aviation abbreviations—'RON' (remain over night), 'ETA' (estimated time of arrival), and 'WILCO' (will comply)—were all started by wireless operators of the old Postal Service.

Working almost without a budget, the Post Office Department talked the cities along the line into providing land, a hangar, and runways. At Salt Lake City, for example, the original north-south runway was very soft when wet, and the city dumped its "hard garbage" (tin cans) and stove clinkers on the surface throughout the rainy season.

While you're in Salt Lake City, if you're lucky, you can drive to a rose-covered cottage within sight of the airport and spend an hour invading the privacy of a gentleman with pilot's license No. 99.

At 80 years of age, Henry Boonstra is just as sharp as they come. A pilot for the Signal Corps in World War I, Boonstra went directly from the Army to the Post Office Department, ferrying surplus aircraft to the repair depot in the infield of the Indianapolis Speedway. He made one of the early night flights while returning from the Dempsey-Willard fight in Toledo, O., with Indianapolis Star reporter Mary Bostwick in the front seat. He circled the racetrack until enough cars lined up with their lights on for an eventful landing.

Boonstra was also instrumental in the May 1968 delivery of DH-4 "Old 249" to the Smithsonian Institution.

"I flew 249 out of here late in December 1922," he commented. "The weather was bad, but I went east along the Uinta range of mountains that parallels the course into Rock Springs. The carburetor iced up, and I landed on Porcupine Ridge on top of a mountain above the timberline.

"It was about 8 a.m., and the snow was up to my waist. I walked down all that day, that night, and all the next day. I could see a ranch about five miles away, but it took me all day to get there."

As soon as Boonstra reached "civilization," a mule team was sent out to bring back the mail. Later, the Liberty engine was hauled down the hill by a pair of mules, but the airplane remained more-or-less intact. Contrary to the policy of burning aircraft downed in isolated country, "Old 249" sat for 43 years too far out in the backwoods for people to strip it.

When John W. (Bill) Hackbarth (AOPA 212378), air mail mechanic and later pilot from Santa Paula, Calif., decided to rebuild a DH-4 to deliver over the old transcontinental route on the golden anniversary of the start of the air mail service, he chose "Old 249." He discussed the project with Boonstra and then "trucked down about 600 pounds of junk" to start his rebuilding project.

Even Art Johnson had a hand in rebuilding "Old 249." His home is within an hour's drive of Santa Paula, and Art spent spare time helping with bits and pieces of the old bird. He built the wing struts by hand in his workshop.

Boonstra flew the same route for 15 years in DH-4s, Boeing 40-B-2s and 4s, the Boeing 247, and the 80-H Boeing Trimotor, after the Post Office Department turned the run over to Boeing Air Transport in 1927.

"We were just getting the DC-3s when I quit," he commented quietly. "I considered the Salt Lake–Rock Springs segment to be the roughest run in the country, but that Reno-SFO airway had a tough little segment."

Today the FSS in Salt Lake City is next to the "old terminal" and has a Weather Bureau (Department of Environmental Services Station) adjoining. The one-man operation begun here 50 years ago by Art Johnson now has a staff of 32 and includes remoted stations at Lucin, Bonneville, Ogden, Fairfield, and Price. Delta is manned 12 hours a day and Malad City 16 hours, with remote service out of SLC for the "midnight shift."

The flight from Salt Lake City to Rock Springs, Wyo., looks rugged even today. Lee Warren, deputy director of the nine-state FAA Western Region, cruised Victor 32 with a *Queen Air* and talked of the growth of the FSS. While he's a relative newcomer to the system, when compared with Art Johnson and Henry Boonstra, Warren began puttering around with aircraft radios in St. Louis in 1931.

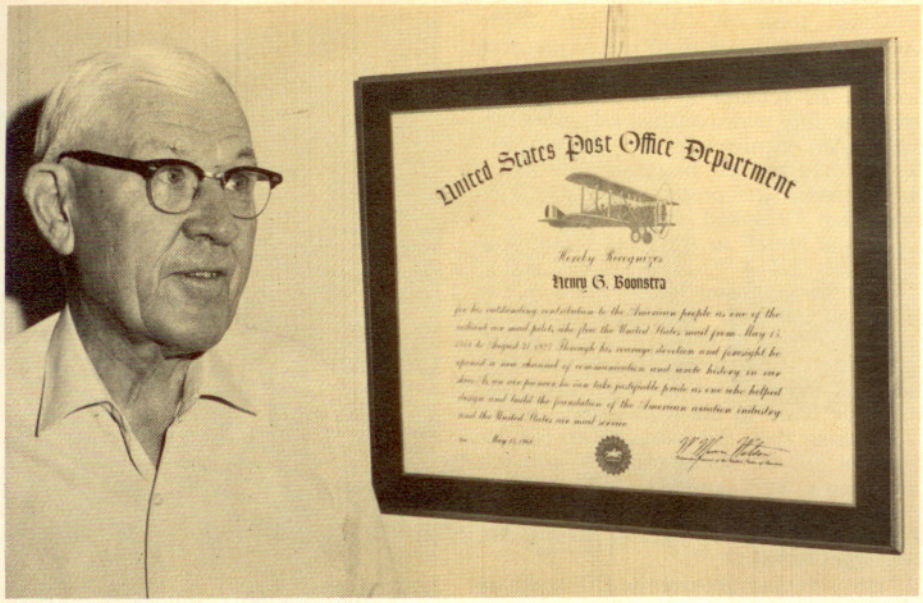
"At first, I couldn't figure out why anyone would want to put a radio in an airplane," he quipped. "Who could hear the music over the noise of the engines?"

Warren worked for American Airways (later American Airlines) and helped develop an interline agreement among AA, Eastern, TWA, and United that developed into the first formal air traffic control system. He invented the word "center" for the Department of Commerce after aviation activities were transferred from the Post Office Department in 1927.

At that time radio stations, beacon lights, and intermediate landing fields were placed under the Bureau of Lighthouses. There was some talk about placing aircraft inspection and licensing of aircraft and airmen in the Bureau of Steamboat Inspection, "but the pilots wouldn't swallow that," remarked Art Johnson. "Instead, an Aeronautics Branch was created and handled such functions."

The first gas beacon was installed in

21-year-old Art Johnson at the entrance of the air mail radio station, Salt Lake City, which he commissioned in 1920. Johnson was a near-legendary radio operator who installed and improved many of the early radio stations in the West. Below is the same Art Johnson 50 years later. He now resides at Santa Monica, Calif.
FAA and Don Downie photos



Henry G. Boonstra, one of the country's pioneer air mail pilots, stands beside a certificate awarded him by the Post Office Department for his service as an air mail pilot from May 15, 1918, to Aug. 31, 1927.

Elko in 1924. Today's electric beacon stands on the same spot where the original beacon was erected on the hill east of the airport.

So Victor 32, once called "Green 3" and first named "The Transcontinental," was no stranger to Lee Warren and Dale Heister, chief of the Los Angeles FSS and a 28-year veteran of the service. While flying *Queen Air* N149, the pair pointed out that many oldtimers preferred outlying stations to working in the big city, even at the expense of a grade in pay.

Typical of these "back country" FSS chiefs is Cliff W. Wheeler, half Alaskan Indian, and 35-year veteran with the FSS and its predecessors. Wheeler was a little late at his Rock Springs station that morning. He'd just seen his No. 2 son, Gary, off for Vietnam and was expecting No. 1 son, Cliff Jr., back from the Far East that same week.

Wheeler would rather go out and fill gopher or badger holes on runways than fight the freeway. (One of his predecessors at Rock Springs interrupted a broadcast when a rattlesnake crawled up through a knothole in the floor of the original downtown wireless station.)

"The smaller towns have better recreational opportunities," he explained, "but there's no dollar advantage. When you're out in the back country, you have a little more authority and perhaps a little less paperwork. It's a satisfying job, and the new electronic aids make it a great deal easier to be helpful than in the old days."

When asked about FSS "saves," the Rock Springs chief was quiet for a minute. "We do things like this almost all the time. It's just part of the service. I can remember the pilot of a 'T-craft' at Malad City who was lost in the mountains to the east. We brought him in to the airport just using landmarks; that was before VHF/DF. He was pretty 'shook up' and so scared that he was sick in the air. When he finally rolled to a stop, he literally got out and kissed the ground."

Looking out over the "low profile" installation toward the tabletop runway, Wheeler continued, "We had a case of a pilot who became ill in the air over the Fort Bridger area. His wife called our specialist Max Fullmer (now at Idaho Falls), who is a pilot. He calmed her down and brought her into our traffic pattern here after 45 minutes of talking. Fortunately, her husband revived sufficiently to take over and land."

Even after 35 years on the job, Wheeler is not anxious to retire. "I enjoy what I'm doing and I'm certainly not ready for a rocking chair. It'll be quite a few years before I get to that mandatory retirement age of 70."

It's 12 miles west from "no-name-mesa" to downtown Rock Springs. The neat tabletop airport replaced the original dirt strip located five miles north of town on the lee side of the White Mountains.

"Most of the early pilots considered [the old] Rock Springs the worst early airport in the West," Boonstra had explained earlier. "It almost always had a hazardous crosswind, and the currents off the mountains were terrible."

One of the Rock Springs residents who was "just messing around the wireless station as a kid" is Ray Ajo. His first checks came from the Post Office Department when he was a mechanic's helper. When Boeing Air Transport (later United Air Lines) took over the service, Ray stayed on and helped put 2,000-pound loads (400 pounds over gross) in the two mail pits of the Boeing B-2s.

Ajo spent 28 years in various phases of air mail and retired as manager and supervisor for United Air Lines. All of his duty was spent in Rock Springs.

"When we started, we had $80 per month for working all hours. There were no benefits, but we were so dedicated to the job that no one thought much about those things . . . One of the jobs I had was to change all the beacon lights between here and Salt Lake."

Today the hop from Rock Springs back to Los Angeles is strictly "no sweat." Cruising at 10,500 feet and sipping a little oxygen, you have radar traffic advisories over most of the route. The "system" vectors you through the smog and to a routine touchdown at bustling LAX terminal.

Next time you walk into an FSS for an in-person preflight briefing, you may find the man (or woman) behind the counter of fairly young age. However, in the background is a system that started with almost nothing and has shown a remarkable growth in its first 50 years.

Happy anniversary! □

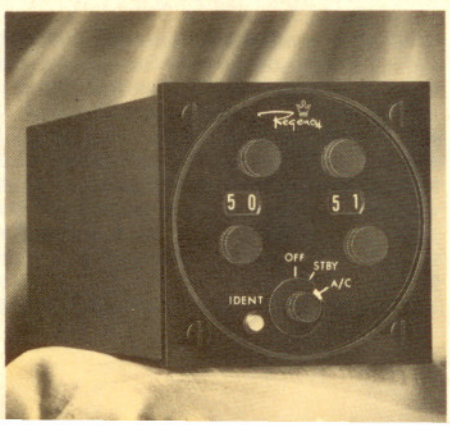
Regency Introduces New Transponder

■■ A transponder designed for installation in aircraft instrument panel holes has been introduced by Regency Electronics, Inc. The new Model 505 I 4096-code transponder measures 3¼ by 3¼ by 10 inches and weighs only 3.5 pounds.

A company spokesman said the new unit is designed to meet a market need for easy and convenient installation in instrument holes.

The unit has been given an $895 price tag.

Solid-state and integrated circuitry of the new transponder provides altitude-reporting capability and features simplified switching by automatically meeting Mode A and Mode C requirements from the A/C function position.



Need for low-sensitivity position on the controls is eliminated by built-in side-lobe suppression.

Current drain is measured at 1.7 amp. for 500-watt power output on 14 volts or optional 28-volt power converter.

"Red-by-night" and "white-by-day" backlighting is utilized for easy-to-read coding and function switching, which features pointers to off, standby, and Mode A/C positions.

The soft amber reply light serves as a constant self-test facility, as well as push-to-squawk-ident facility. □

Regency Electronics' new Model 505 I transponder.