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Release No. 1666490

WASHINGTON, July 7---Score and Courier, the two electronic packages that opened up today's world of globe-circling satellite communications and foreshadowed Telstar, Relay, Syncom and the Communications Satellite Corp., were presented by the Army today to the Smithsonian Institution.

Both Score and Courier were satellites developed at Fort Monmouth, N. J., by what is now the Electronics Laboratories of the U. S. Army Electronics Command, a major element in the Army Materiel Command. The organization was then the Army Signal Research and Development Laboratories.

Score, sent aloft from Cape Kennedy (then Canaveral) on Dec. 18, 1958, carried President Eisenhower's "Peace on Earth" Christmas message to the world. But it did much more. It proved that active-relay type satellites could receive both voice and teletypewriter signals from the ground and either relay them directly or store them on magnetic tape and carry them on to the next station, to be released on command.

It was the world's first communications ~~satellite~~ ^{satellite}.

Courier, much more sophisticated and with a far greater capacity than Score, was launched October 4, 1960. Actually it was Courier 1-B, because the first Courier launching, 1-A a few months earlier, failed to place the "bird" in orbit. Courier could either relay directly or store and forward nearly 400,000 words -- about three novels -- in one four minute pass over a ground station.

Both satellites were major steps forward in the space age -- Score (for Signal Communications by Orbiting Relay Equipment) not only opened

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the satellite communications age, but was a major boost for 1958's U. S. prestige around the world.

Score upped the U. S. score to four successful satellites to the Soviet Union's three, and by transmitting intelligible messages it proved to the general public that artificial satellites were something more than vehicles launched to orbit the earth for more or less vague scientific purposes.

Furthermore, Score was the first U. S. satellite visible to the naked eye under proper conditions. While the actual communications packages weighed less than 50 pounds each -- there were two attached piggyback to a four-ton Atlas missile -- the U. S. Air Force achieved a major triumph in orbiting the entire rocket, plus payload, providing a first rate visual target at sunrise or sunset.

The Score satellite electronics packages were designed and built by scientists and engineers from the U. S. Army Electronics Laboratories at Fort Monmouth under conditions of the greatest secrecy. The one presented the Smithsonian is a third, or "backup," in effect a new "spare tire."

Only 88 men in the nation, among them the group of engineers, technicians and scientists from the Fort Monmouth Laboratories, knew about Score and its objectives.

At the same time the Fort Monmouth men working on Project Score were able to tell their wives, families and associates what they had been working on for the past six months, erasing at one stroke wifely suspicion about overtime work and unkind remarks about boondoggling by unknowing associates.

Score was largely designed and built at the Laboratories, but major components were made by a number of contractors, including Radio Corporation of

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America, which made the transmitters and receivers to Laboratories specification

Score remained in orbit and active for 34 days before its perigee dropped so low that it burned up in the atmosphere. It had an initial apogee of 920 miles and a perigee of 110 miles. Its initial orbit period was 101.46 minutes. Its information frequencies were 132.435 and 132.095 megacycles, and its beacon 107.94 and 107.97 megacycles.

While Score was a major achievement, it was as primitive compared to Courier as Courier is to the Syncom satellite which maintains its position over one section of the earth. Score could only relay information -- either in real time or store and forward -- at the same speed as the normal human voice talks or teletypewriters operate.

The 500-pound Courier was a complete satellite. The electronics package - an exact duplicate of the backup satellite being presented to the Smithsonian, was a complete space relay for voice and teletypewriter messages and facsimile-- that is, it could and did relay photographs or other pictorial material.

The "bird" itself was built by Philco Corp., a ^{subsidiary} ~~division~~ of the Ford Motor Corp., under the technical supervision of the Fort Monmouth Laboratories. Its tremendous capacity was achieved by sophisticated ground equipment that took ordinary punched teletypewriter tape or magnetic tapes of the human voice and converted them to bits that were then electronically speeded up by several orders of magnitude, re-inserted on magnetic tape for transmission to the satellite itself. When messages were received back from Courier they went through a reverse process to become intelligible.

The ground equipment was built by International Telephone and Telegraph Corp., Nutley, N. J., and its two antennas, one erected at Fort Monmouth and the other in Puerto Rico, were built by Radiation Inc., of Melbourne, Fla. All work was under the technical supervision of the Army Electronics Laboratories

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Courier, which is still circling the earth, although it is non-operative, was launched by a Thor-Able-Star missile and achieved a near-perfect orbit with a period of 106.9 minutes, an apogee of 767 miles and a perigee of 586 miles. Its information frequency was between 1700 and 2300 megacycles, its telemetry frequency 108 and its beacon 107.9 megacycles.

It operated successfully for 17 days, relaying millions of words both teletypewriter and voice, between Fort Monmouth and Puerto Rico, in both real-time and store-and-forward. It also successfully relayed the first photograph ever sent into space and returned to earth, with the facsimile-type transmission being made during one four-minute pass over the Fort Monmouth station.

Courier also relayed thousands of words of news copy for the nation's newspapers, wire services and technical publications, all of which were printed under the line "Via Courier Satellite."

A further sidelight on its efficient operation was the conversations between the technical crews at Fort Monmouth and Puerto Rico. When normal land and radio lines for telephonic communication between the two points were clogged, important messages and even casual conversations were relayed in both directions by Courier with the greatest clarity.

Today's artificial communications satellites, such as Telstar and Relay, have much greater bandwidths than Courier and can therefore relay not only messages but television. And Syncom, doing a lazy figure 8 out in space over one spot of the earth is not limited in operating time by an orbit.

But Courier, and its primitive predecessor, Score, were the first vehicles to prove the immense possibilities of satellite relay of communications of all types. These Army research and development projects -- the first active-relay communications satellites--opened a whole new world of high-speed, high-capacity world-wide satellite communications.