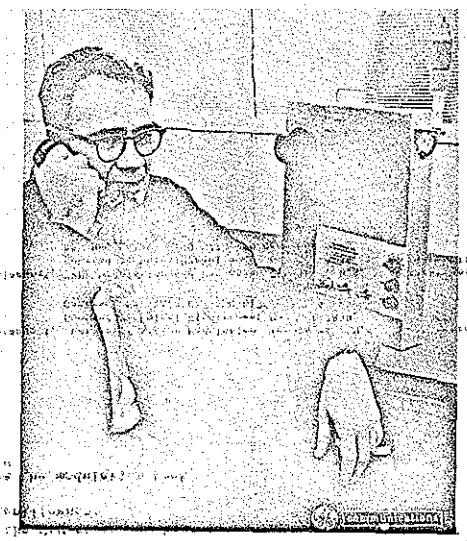


GIFFORD: "...we must never forget."



LATKER, inventor of CPM: He didn't.

THE CPM STORY

Ten years ago, CPD conducted an Advanced Study Program on narrow band modulation techniques. AM systems, including single and double sideband with various degrees of carrier suppression, were evaluated along with sliver band FM. This recommendation emerged from the study:

> "Find another solution that has all the advantages of SSB and sliver band FM -- a shot in the dark, perhaps, but one that we must never forget." [1]

Four years later, A. C. Latker, an Electronic Systems Engineer in CPD's Military Engineering Subsection, had not forgotten:

> "The purpose of this disclosure is to describe a method whereby infinitely clipped or constant amplitude speech can be transmitted as a single sideband signal (SSB) utilizing a conventional FM transmitter employing normal multipliers and Class C stages." [2]

Thus, in a six-page patent disclosure, Latker delivered the classic a-priori response to that early, almost prophetic recommendation; resources were needed, however, for experimental implementation and the development of some empirical data.

When, on December 16, 1963, two years after his patent disclosure, Latker decided to discuss his idea with the U.S. Army Electronics Command, he soon found an attentive ear. John Hessel, Technical Director of the Communications/ADP Commodity Office at Fort Monmouth, realized the enormous economic and functional potential of CPM to military as well as commercial users. A Company-funded engineering project authorization (EPA-407) enabled the construction of some feasibility demonstration breadboards and Hessel, who participated in some of Armstrong's FM work a generation before, flew to Lynchburg to witness the first laboratory demonstration of CPM on April 3, 1964.

Then others came. With the help of R. A. Kulinyi and A. C. Colaguori of Fort Monmouth's Transmission Division, an R&D program was planned. "Range/Energy requirements"[3] were discussed in economic terms as well as those of system performance. In certain tactical situations, the potential of extended range was paramount; in others, sharply reduced primary power requirements meant cost, logistic and mobility advantages. Moreover, the possibility of greater channel capacity was noted in their technical appraisal of CPM. During this period Latker added a 40 MHz carrier supply to his earlier breadboards and successfully demonstrated the feasibility of CPM at VHF for the first time.

An R&D contract[4] for the first exploratory CPM equipment was negotiated on December 30, 1965, and work officially began February 14, 1966 with G. A. Kious as Project Manager, Latker as Project Consultant, and Colaguori as COTR.

On December 22, 1966, the first working models were delivered to Fort Monmouth, and the Army's first CPM transmissions were made by Colaguori on that same day. These two models, transmitter and receiver, specifically designed for performance comparison with the famous third-generation "Walkie-Talkie" AN/PRC-25, are now undergoing extensive test and evaluation.

Today, a decade after Mr. Gifford's study recommendation, the CPM story may have only just begun -- for an industry now awaits developments of the most profound significance:

> "The objective of this specification is to determine the modulation techniques for the next generation of tactical radio sets ..." [5]

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1 R. P. Gifford, W. H. Shepherd, and A. V. Korolenko, "Evaluation of SSBRC, DSB, DSBSC, and SNPM, In Narrow Band Communications", ASP No. 344-2, Rev. 0, General Electric Company, Communication Products Department, August 30, 1957., p. 12.

2 A. C. Latker, Patent Docket No. 35-73D-177, General Electric Company, Communication Products Department, August 17, 1961., p. 1. (This docket is now designated No. 45-73D-177.)

3 R. A. Kulinyi, "The Effect Of Modulation Systems On Range/Energy Requirements", GE Panel On Systems Effects Of Modulation Schemes In High Density Tactical Radiocommunications, 20th Annual Convention of the Armed Forces Communications and Electronics Association, Washington, D.C., June 8, 1966. Reprinted Signal, Vol. XX, No. 11, July 1966, pp. 81-84.

4 A. C. Colaguori, "Carrier Position Modulation Techniques", U.S. Army Electronics Command Technical Requirement No. SCL-7838, 28 July 1965, Contract No. DA28-043-AMC-01965(E), 14 February 1966.

5 A. C. Colaguori, "VHF Modulation And Detection Studies", U.S. Army Electronics Command Technical Requirement No. SCL-9036, 21 September 1966, RFP No. DAAB07-67-Q-0228, 10 December 1966.