25X1C1a1 [redacted]

RESEARCH & DEVELOPMENT LABORATORY

July 1966

I. GENERAL

1. Messrs. [redacted] 25X1A9 25X1A6 visited [redacted], during July, along with other representatives of the Office of Communications and the DD/P in order to perform operational tests on the [redacted] road-watch communications system. 25X1A9a 25X1A2

2. On 19 July, Mr. [redacted] visited the Laboratory accompanied by Messrs. [redacted] On 28 July, [redacted] on a tour of the Laboratory. 25X1A9a 25X1A9a 25X1A9a 25X1A9a

3. A seminar was conducted at the Laboratory on Monday, 25 July. The purpose of this meeting, attended by members of the Engineering Staff and Operations Support Staff, was to critique the results of the evaluation of a predetection medium-speed receive system conducted at [redacted] earlier this month. The tests were declared highly successful and plans were formulated for further evaluation of this technique in [redacted] 25X1A6b 25X1A6b

II. DESIGN

1. The CK-36 design project, initiated during the month of June, received highly successful operational tests during this reporting period. The CK-36 and its associated ASR-100 VHF transceiver comprise a [redacted] transmitter designated the [redacted]. The operational test conducted in Florida involved the [redacted] and two relay aircraft operating over a path of 240 miles from [redacted]. The [redacted] operating in moderate foliage cover successfully transmitted up to 90-miles to the first relay aircraft which then relayed the VHF signal up to 180-miles to the second aircraft orbiting 100 miles north of Miami. The second aircraft then relayed the signal to the base station operating at [redacted] 25X1C1a1 25X1A2g 25X1A2g 25X1A6a 25X1A2g 25X1A6b

[redacted] 25X1A9a

2. The design project, initiated during January of this year to provide a half duplex teletype capability operating over an existing IS-5 infrared communications link, was completed this month. The complete teletype system has been assembled, tested, and forwarded to the operational area for installation. Mr. [redacted], a design engineer from the Laboratory, will travel TDY next month to complete installation of the system.

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3. The prototype of the HG/A-49, a modified HG-48 handcrank generator designed to charge the 42-volt RT-49 power supply, was successfully tested during July. Production of 50 units will commence immediately.

4. A medium-speed base station receive system featuring broadband predetection recording of the receiver IF was successfully evaluated this month at [redacted] Upon completion of the evaluation, the Laboratory was assigned responsibility for assembly and check-out of one complete system carrying the nomenclature, PD-1, to be shipped to [redacted] the first week in August. Mr. [redacted] Laboratory design engineer, will visit [redacted] TDY to install the system, along with Mr. [redacted] who will instruct PCS operating personnel in its use.

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5. A new design project was initiated this month for the development of the RR-75 receiver. The RR-75 will feature 2 - 7 mHz frequency range with three internal and one external crystal channels and a ferrite loop antenna housed in a plastic case. This receiver is intended to be a replacement for the RR-44 built by [redacted]

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6. A study project was initiated during this reporting period to determine the feasibility of improving the IDY control unit of the RS-503 ELD base station. As a result of recent long range [redacted]

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III. ANALYSIS & APPRAISAL

1. Five evaluations were published and distributed during July. Six other evaluations were completed and the reports written. These are in process of being published. Five evaluations are presently in the testing phase.

2. The CK-30 coder/keyer was developed by [redacted] 25X1A5a
25X1A5a1 [redacted] The CK-30 is an electro-mechanical device used to store information and subsequently key a transmitter with the stored information. It has a storage capacity of 300 groups in the magnetic memory and keys a transmitter at the rate of 300 wpm. One outstanding feature of the unit is the remarkable reduction in size compared to the CK-8 system. The unit performed well, both mechanically and electrically. The performance of the Mylar tape storage is considered superior to that of the steel tape storage. Several sprocket holes in the steel tape were torn out during the tests. The mechanical noise level of the unit is high. The unit is compatible with the RT-49 but compatibility with the RT-48 was not accomplished.

3. The Racal Model MA-333 frequency synthesizer was manufactured
25X1A5a1 by [redacted] The unit is a subminiature device used to generate RF excitation frequencies over the range of 2 to 9.999 mHz in one kHz steps. Control is obtained by use of four decade dials. A multipin cannon socket provides all the inputs and outputs of the device. The unit can be modulated on/off or FSK by applying proper voltages to designated pins on the connector. The unit has excellent electrical and mechanical performance characteristics. Drift is minimal and is easily within the specification over the temperature range of 0° to 50°C. The only deviation from specification was on FSK keying. The frequency shift averaged 400 Hz rather than the 800 Hz specified. The output voltage is the specified one volt. This very possibly would not be enough to drive transmitters such as the RT-49, RT-48, and AT-3.

IV. FABRICATION

1. One new production project initiated this month calls for a rerun of the Simplex time-date stamp modification. This modification is to increase the throat depth from 2-inches to 3 7/8 inches. These units are required by the Signal Center for the new message format. Two additional units will be modified.

2. Three production projects were completed this month. The first was for the conversion of AM/A-2 antenna tuners to AM-2B tuners. The modification was to lower the operational frequency range from 130-170 mHz to 25-55 mHz. The AM-2B is designed to enable operation of a Motorola P series transceiver into a conventional automobile receiving antenna. Twenty-two units were modified and returned to the warehouse for stock.

3. The second completion was for the AU-11 accessory unit designed for use with, and stored within, the TS-10 test set. The AU-11, in providing selection of various signal output levels from the TS-10, will enable it to be more effectively used in its intended purpose of maintaining the CU-10, 150-cycle IDY recognition unit presently used in medium-speed receiving positions. Twenty-two units were delivered to the warehouse for inclusion in the TS-10 test sets.

4. The third completion was for a personnel alerting system consisting of a G.E. Porta-Mobil transceiver, a CU-20 tone generator and two Motorola Page Boy receivers. One system was constructed and delivered for forwarding to an operational area.

5. In addition to the above, a partial delivery of 39 HG-48A hand-crank generators were made to the warehouse for stock.

6. Value of equipment fabricated in the Laboratory and delivered to the warehouse this month was $25,320.00.

V. ADMINISTRATIVE

TDY

25X1A9a [redacted] AMCA [redacted] 1 July
11-14 July
11-14 July
12-14 July

TRANSFERS

25X1A6a

N. A.

PCS

N. A.

EOD

N. A.

RESIGNATIONS

N. A.

EFFECTIVE PROMOTIONS

N. A.

TRAINING

N. A.

OTHER

N. A.

and collect meaningful ionospheric data over the path in use so as to accurately interpret results, be they good or bad. HF

EXTERNAL PROJECTS SECTION

July 1966

I. PROJECTS

With the start of a new fiscal year, it is appropriate that we review some of the highlights of FY-66.

The final days of FY-66 saw our R&D allotment inch into the red. Our spending for the year amounted to $2,692,993.50 putting us almost $18,000 over the budget. (Twenty-five thousand of our original $2.7 million was transferred to the R&D Laboratory account.) This was caused by a last-week-of-the-fiscal-year need for an additional $26,328 in one of our service contracts.

The largest single expenditure in FY-66 was $518,696 for the AR/A-18 receiving system. This will provide a modern, useable base station for our 1480 word-per-minute triphase HF systems. Our next largest expenditure, $358,703 will permit an exhaustive field test for the AS-12 agent high speed communications system. Although this seems to be a large amount of money to spend for a field test, with over two million dollars already invested in the AS-12, it would be false economy to not fully test the system to uncover all its capabilities and limitations. Two hundred thirty-four thousand and thirty dollars was committed to ARLS; while this project was funded through R&D, it will be monitored by the Engineering Services Branch. The RS-101 received $219,925.00. As of this writing, we are only days away from receiving the engineering model of the RS-101, and we are still optimistic about its being a satisfactory replacement for and a significant improvement over the RS-1. The RS-520 agent facsimile system had progressed to the point where we began a $215,173 development of the RS/B-43 microwave link. This sum will be devoted to expanding the bandwidth, reducing the size, and increasing the output power of the RS-43. We began development of the RS-523 surveillance transmitter and receiver. This $174,445 venture leads OC into a previously forbidden operation, that of voice privacy. Difficulties in getting a free ride for our satellites caused us to spend $124,336 to adapt the "bird" to an available launch vehicle.

and it looks very, very good! HF

Not all of our expenditures were in the six figure class. Some "small" projects may have far reaching effects. Of particular significance was a $5,100 adjunct to the intercept/DF study which was funded in FY-65. In light of some of the conclusions, we are presently reevalu-

ating our entire medium-speed technique. The $16,600 SY-3 development shows strong promise of finally filling the requirement for a one-way voice line message synthesizer. Considerable work was performed in the field of antenna development, and much of this was done under service contracts. While the results are not yet in, we feel that we are much closer to more efficient agent antennas for both long haul HF and short range ELD.

In the coming year we expect to see significant improvements in our medium-speed and ELD systems.

II. ADMINISTRATIVE

TDY

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St. Louis, Missouri	7 - 8 July
Princeton, New Jersey	6 July
San Francisco, Calif.	27 July
Los Angeles, Calif.	28 July
Briarcliff Manor, N.Y.	20 July
Cincinnati, Ohio	14 July
Metuchen, New Jersey	18 July
Middletown, New Jersey	19 July
Kokomo, Indiana	7 July
Skokie, Illinois	8 July
Dallas, Texas	7 July

TRANSFERS

N. A.

PCS

N. A.

EOD

N. A.

RESIGNATIONS

N. A.

EFFECTIVE PROMOTIONS

N. A.

TRAINING

N. A.

OTHER

N. A.