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Department of the Army
Ballistic Missile Defense Systems Command
P. O. Box 1500
Huntsville, Alabama 35807

ANNUAL HISTORICAL REVIEW
(RCS CSHIS-6 (R3))

KWAJALEIN MISSILE RANGE

1 OCTOBER 1978 to 30 SEPTEMBER 1979

APPROVED BY:

ROBERT A. PARSONS
Colonel, GS
Director, Kwajalein Missile
Range Directorate

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ANNUAL HISTORICAL REVIEW
KWAJALEIN MISSILE RANGE
OCTOBER 1978 - SEPTEMBER 1979

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Chapter I

MISSION AND ORGANIZATION

Mission and Organization

The mission of the Kwajalein Missile Range Directorate (KMRD), located in Huntsville, Alabama, is to plan, manage, direct, control and coordinate the overall activities of the Kwajalein Missile Range, a Department of Defense (DOD) National Range, in accordance with DOD National Range policies and procedures and under the guidance and direction of the National Range Commander.

The Directorate also serves as the principal advisor and staff to the National Range Commander for all matters pertaining to the KMR to include matters pertaining to the Trust Territory of the Pacific Islands (TTPI).

The mission of the Kwajalein Missile Range (KMR), located on the Kwajalein Atoll, Marshall Islands, is to direct, maintain and operate a National Range, and provide associated services and materiel to support range users and tenants at the KMR. The KMR is government owned and contractor operated. Logistics support is provided by Global Associates under Contract DASG60-80-C-0001. Technical facilities, with the exception of the Kiernan Reentry Measurements Site (KREMS), are operated by Kentron, International, Inc. under Contract DASG60-76-C-0002. The KREMS is operated by RCA and GTE/Sylvania under the technical direction of Massachusetts Institute of Technology Lincoln Laboratory. A map of the Range showing equipment location is shown in Figure 1, page 49.

The Kwajalein Missile Range Directorate organization is shown on Figure 2, page 50. Office symbols for the Directorate are listed in Table 1, page 51.

Staffing

Personnel strengths for the KMRD are reflected on Table 2, page 52. A Command reduction reduced the Directorate by one civilian space in FY 79. Key personnel of the Directorate are listed in Table 3, page 53.

Funding

The approved funding program to accomplish the mission for FY 79 was **$87,620,000.** Table 4, page 55, reflects a summary breakout of the FY 79 approved funding program.

In addition to the above funding guidance, the KMR was provided funding by range customers in the amount of $17,724,000 in FY 79. Table 5, page 56, reflects the range users and amount of reimbursement funding provided them.

Range Commanders Council

The Range Commanders Council, founded in August 1951, and discussed at length in the FY 72 Historical Summary, continued to function; and the Commanders convened their semi-annual sessions (Fall and Spring) during FY 79 for technical interchange of matters affecting the National and Service Ranges.

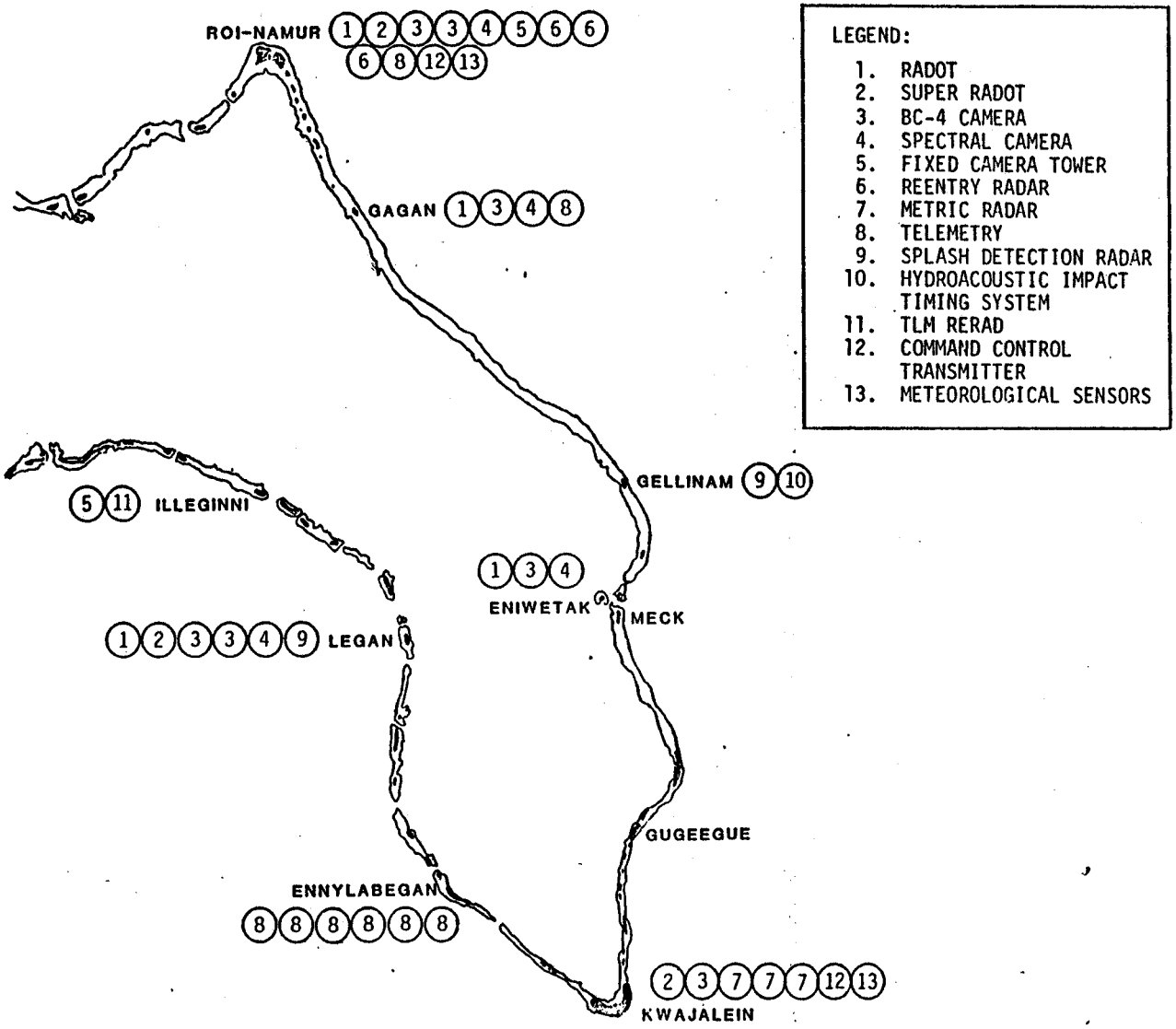

Figure 1. (U) Kwajalein Missile Range

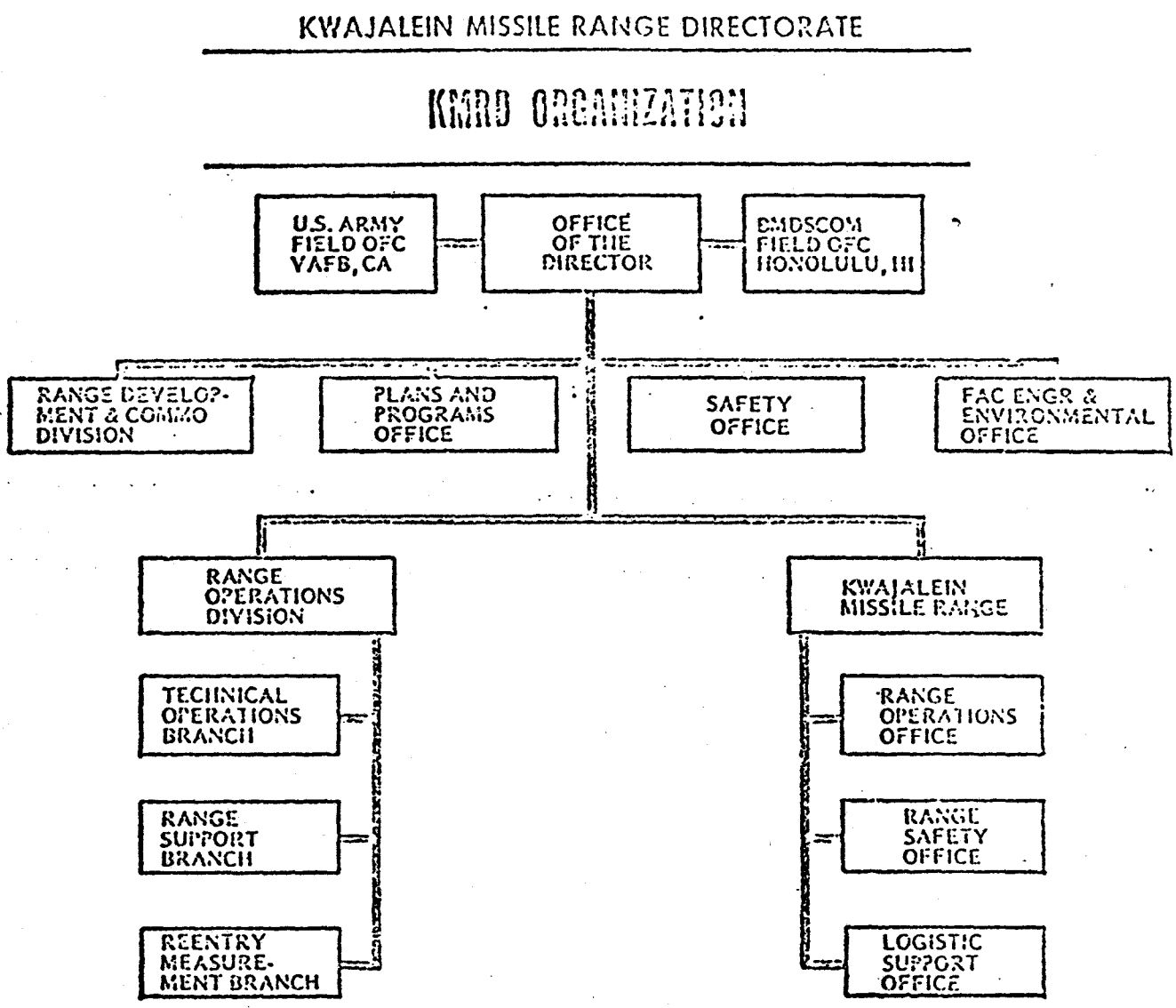

Figure 2. (U) Kwajalein Missile Range Directorate (KMRD) Organization

OFFICE SYMBOLS
BALLISTIC MISSILE DEFENSE SYSTEMS COMMAND
P.O. BOX 1500
HUNTSVILLE, ALABAMA 35807

SYMBOL	ORGANIZATIONS
BMDSC-R	Office of the Director, Kwajalein Missile Range Directorate
BMDSC-RA	Administrative Office
BMDSC-RP	Plans and Programs Office
BMDSC-RS	Safety Office
BMDSC-RE	Facilities Engineering and Environmental Office
BMDSC-RO	Range Operations Division
BMDSC-ROO	Technical Operations Branch
BMDSC-ROS	Range Support Branch
BMDSC-ROM	Reentry Measurements Branch
BMDSC-RD	Range Development and Communications Division
BMDSC-RK	Kwajalein Missile Range
BMDSC-RV	U.S. Army Field Office- Vandenberg AFB, CA
BMDSC-RH	BMDSCOM Field Office- Honolulu- Hawaii

Table 1. (U) Office Symbols

PERSONNEL STRENGTH

	KMRD & FLD OFCS		KMR	TOTALS
30 Sep 77	MIL	8	20	28
	CIV	71	31	102
				130
30 Sep 78	MIL	7	20	27
	CIV	72	32	104
				131
30 Sep 79	MIL	7	20	27
	CIV	71	32	103
				130

Table 2. (U) Personnel Strength

KEY PERSONNEL

POSITION		
KWAJALEIN MISSILE RANGE DIRECTORATE OFFICE OF THE DIRECTOR		
DIRECTOR	COL ROBERT A.PARSONS	Jun 78 -
DEPUTY DIRECTOR	MR. O.E. OVA	Jun 64 -
EXECUTIVE OFFICER	MAJ C.D. WILKINSON	Jun 78 - Jun 79
	LTC JOHN J. KOISCH	Jun 79 -
CHIEF, U.S. ARMY FIELD OFFICE, VAFB	LTC QUINTON P. BOYD	Jul 77 -
CHIEF, FIELD OFFICE, HONOLULU	LTC LOUIS J. PARISON	Nov 74 -
CHIEF, PLANS AND PROGRAMS OFFICE	LTC W. H. GRISWOLD	Apr 73 -
CHIEF, SAFETY OFFICE	MR. T. M. PERDUE	Oct 67 - Dec 78
	DR. C.D. SMITH	Dec 78 -
CHIEF, FACILITIES ENGINEERING AND ENVIRONMENTAL OFFICE	MR. JOHN E. ROGERS	Feb 69 -
RANGE OPERATIONS DIVISION		
CHIEF	MR. H. R. BRASWELL	Sep 76 -
CHIEF, REENTRY MEASUREMENTS BRANCH	MR. MICHAEL HOLTCAMP	Sep 76 -
CHIEF, TECHNICAL OPERATIONS BRANCH	MR. ALVADOR AMADOR	Jul 77 -
CHIEF, RANGE SUPPORT BRANCH	MR. REINHART LEO	Feb 71 -

Table 3. (U) Key Personnel

CHIEF, RANGE DEVELOPMENT AND COMMUNICATIONS DIVISION	MR. HARRISON MAXEY	Jul 76 -
KWAJALEIN MISSILE RANGE		
OFFICE OF THE COMMANDER		
COMMANDER	COL JOHN H. REEVE	Jun 78 -
DEPUTY COMMANDER	LTC MARTIN G. OLSON	Jul 77 -
CHIEF, RANGE OPERATIONS OFFICE	LTC ARGIE E. HADDOCK	Jun 78 -
CHIEF, RANGE SAFETY OFFICE	MAJ M. T. LLOYD	Jan 77 - Jul 79
	LTC J.C. COOPER	Jul 79 -
CHIEF, LOGISTIC SUPPORT OFFICE	LTC ALBERT CAMPBELL JR	Jun 78 -

UNCLASSIFIED

PROGRAM STATUS

AS OF 30 SEP 79

PROGRAM MANAGEMENT	$ 4.691M
GOVERNMENT SUPPORT SVCS	7.124
MATERIALS AND SUPPLIES	10.669
MODERNIZATION	3.619
CONTRACT SUPPORT	61.517
TOTAL	$87.620M

Table 4. (U) Program Status

KMR DIRECT SUPPORT REIMBURSEMENT

FY 79

Army		
BMD Advanced Technology Center		$ 1.614M
BMD Systems Technology Program		4.766
Air Force		
Air Defense Command		.040
Air Force Eastern Test Range		.041
Electronic Systems Division		6.893
Western Space and Missile Center		4.039
Other		
Defense Nuclear Agency		.285
NASA		.046
	TOTAL	$17.724M

Table 5. (U) KMRD Customer Funding

CHAPTER II

RANGE USERS

The Kwajalein Missile Range (KMR) was established as a national range in 1968 and has the mission of providing support facilities and technical services for DOD components responsible for RDTE of weapon systems and materials. KMR also supports other federal agencies having a need for its support as well as domestic and foreign government agencies under certain conditions. A summary of the range user programs in planning or in progress at KMR in FY 79 is given below:

Army Programs

Ballistic Missile Defense Advanced Technology Center

The Army Optical Station (AOS) on Roi-Namur is an optical scanning and tracking facility designed to obtain infrared signatures and other characteristics from targets of opportunity. During FY 77, a Laser Radar (LITE) augmented the optical system for collection of other experimental data. This program continually gathers and builds a data base of optical measurements and signatures from the multi-variety of reentry vehicles.

The Designating Optical Tracker (DOT) program experiments are designed to determine the ability of missile borne optical sensors to designate and track incoming reentry vehicles. During FY 79, KMR successfully supported missile launches associated with this program.

Multi-static Measurements System (MMS), a program jointly funded by BMDATC and BMDSTP, has as its objective the increased accuracy and reliability of metric measurement of RV trajectories. Remotely located radars provide different views of the same target in real time. Considerable design and installation progress was achieved during FY 79 toward a system operational date of July 1980.

SIDEFLASH, a joint ATC-STP program experiment, is a test effort to make radar cross section measurements for various aspect angles of the incoming RVs using a surplus Ka-Band Splash Detection Radar. Assembly and integration with the SEL 810A computer were accomplished and the mount drive system and encoders tested during FY 78. A Synchronized Time Code Generator (STCG) was installed and is now operational. During FY 79 attempts to gather signature data with this radar showed limited success.

Ballistic Missile Defense Systems Technology Program

The Systems Technology Test Facility located on Meck Island is currently undergoing system integration testing and exercising against various targets of opportunity. This facility consists of the systems technology radar subsystem and a data processing subsystem. It will be used as a test bed for future BMD applications.

Air Force Programs

Advanced Nosetip Program (ANT) is a sub-program of the Advanced Ballistic Reentry Systems (ABRES) with the purpose to obtain reentry technology information on various nosetip designs and materials and to develop a system of multiple reentry vehicles to be flight tested on MINUTEMAN I boosters. This program was successfully concluded in FY 79.

The Technology Development Vehicle (TDV) Program is to develop a reentry vehicle which can be used as a test bed for a variety of experiments with the goal of obtaining required experimental data at minimum cost. Objective of the test program is to obtain flight test data on a variety of ABRES experiments.

The Reentry Environment Measurements Program (REMP), an ABRES Program, will obtain target area data on ABRES flights into KMR. Weather measurements will be made with the objective of obtaining quantitative hydrometeor characteristics as a function of altitude. A variety of sensors are used to make these measurements in a time correlated fashion, so that comparisons and correlations can be made with the data obtained from the instrumented reentry vehicles carried by ABRES missiles. REMP supports ANT, TDV, IRS, AMARV and ABRV, and follow-on programs in the planning stages. The Advanced Ballistic Reentry Vehicle (ABRV) Program is intended to provide accurate reentry systems options for MX and TRIDENT II (D5) applications and to validate these options by ground and flight tests into KMR. The purpose of the flight test program is to assess reentry vehicle performance in the areas of accuracy, survival and subsystem(s) operation, dispersion contributors and model verifiction. KMR successfully supported two ABRV flights during FY 79.

The HAVE JEEP Program is a continuing program for testing small payloads utilizing low-cost sounding rockets, launched locally, to simulate ICBM reentry. Launches are made from Roi-Namur Island. Tests are accumulated and launches are conducted on an annual basis. Each annual test usually involves a variety of payloads.

The MINUTEMAN III Flight Test Program involves flight tests of Special Test Missiles (STM) and Production Verification Missiles (PVM). Reentry vehicles are targeted into KMR and require a full range of reentry measurements, scoring, telemetry, optical, and meteorological support.

The SAC MM II Operational Tests (OT) are designed to define the operational capability of the MM II weapon system. Test objectives include miss distance, reentry accuracy, fusing accuracy, chaff geometry, and signature. This requires metric, signature data, telemetry and impact scoring by KMR.

The SAC MM III Operational Test Program has the same general objectives as discussed for the MM II OT above and requires the same KMR support. For the first time reentry vehicles were targeted for land areas during FY 79.

The TITAN IIIC supports diversified DOD and NASA payloads. Support requirements are identified with the particular payload program. Present planning

predicts an average of three launches per year from Patrick AFB. KMR support is required for telemetry and metric data acquisition for orbital missions.

In the Space Object Identification (SOI) Program, the KMR radars, (TRADEX, ALCOR, and ALTAIR), respond to the operational requirements of the USAF spacetrack system during normal duty hours on a non-interference basis with other range requirements. Approximately 60 identifications per year are made.

A test of ALTAIR capabilities to support the Air Force's Space Detection and Trailing System (SPADATS) was successfully concluded in Feb 79.

The Thrusted Replica Decoy Program (TREP) obtains technology needed to extend the effective penetration altitude of replica decoys with thrusting.

Interim Reentry System (IRS) provides that multiple small reentry vehicles be flown simultaneously on a MINUTEMAN I booster. Tests are to cover reentry performance of nosetip and heat shield materials and recovery of a high performance reentry vehicle from one clear air and one heavy weather reentry.

Navy Programs

Radar Imaging is a program wherein aircraft and ship identification is accomplished. This Office of Naval Research Program is generally pursued by using targets of opportunity in the KMR vicinity.

Support programs during FY 78 included mapping services, data reception and reduction, and other various accomplishments.

National Aeronautical and Space Administration (NASA)

NASA is establishing a Mobile Laser Station (MOBLAS) on Roi-Namur to provide tracking and ranging data in support of the SEASAT-A Project which is part of the Earth and Ocean Dynamics Applications Program (EODAP). This is the first major step in developing and demonstrating a system capable of providing, from space, global monitoring of wave height and directional spectra, surface winds, ocean temperature, mapping of global ocean geoid, measuring precise sea surface topography, detecting currents, tides, storm surges, tsunomis, and charting ice fields and leads.

The SKYLAB operation consisted of orbital vehicle tracking during the final days of this satellite in orbit. Tracking data was obtained and transmitted to Goddard Space Flight Center.

Defense Nuclear Agency

The Wide Band Equatorial Program was conducted with simultaneous measurements of the effects of ionospheric and transionospheric scintillation on satellite communications. Excellent data were obtained in this program during July 1979.

Support is also provided DNA during their annual radiological surveys of areas formerly utilized as nuclear testing sites.

Missions

During FY 78, the Kwajalein Missile Range (KMR) participated in approximately 330 missions including 219 Earth Resources Support System (ERSS) and Defense Meteorological Satellite Program (DMSP) meteorological rockets launched from KMR, 72 Systems Technology Program (STP) support operations, and 11 Special Test missions. Major missions were:

17 Nov 78	Mission 8310, designated GT-130M, a SAC MINUTEMAN II operational test.
28 Nov 78	Mission 8344, designated ANT-3A (Advance Nosetip-3), a BMO/ABRES research and development mission.
6 Dec 78	Mission 6065, designated GT-38GM, a SAC operational test and target missile for DOT mission 8883.
6 Dec 78	Mission 8883, designated DOT-1, an Army ATC designating optical tracker advanced research and development test.
9 Dec 78	Mission 8462, designated STM-17W (Special Test Missile), a BMO MINUTEMAN III metric and signature test.
13 Dec 78	Mission 2855, a TITAN III-C satellite insertion mission. KMR provided telemetry and communication support.
20 Jan 79	Mission 6278, designated STREP-I, the first two MINUTEMAN I's in a series of four dedicated missions for the STP.
24 Jan 79	Mission 6595, designated ABRV-1 (Advanced Ballistic Reentry Vehicle-1), a BMO/ABRES research and development mission.
31 Jan 79	Mission 8292, designated GT-66GM, a SAC MINUTEMAN III operational test.
7 Feb 79	Mission 1205, designated GT-67GB, a SAC MINUTEMAN III operational test.
16 Feb 79	Mission 7535, designated PVM-16 (Production Verification Missile), a BMO metric and signature mission.
24 Mar 79	Mission 5865, designated GT-137M, a SAC MINUTEMAN II operational test.

28 Mar 79	Mission 4137, designated GT-39, a SAC MINUTEMAN III operational test.
20 Apr 79	Mission 6980, designated PVM-17 (Production Verification Missile), a BMO metric and signature mission.
10 Jun 79	Mission 6800, a TITAN III-C satellite insertion mission. KMR provided telemetry and communication support.
7 Jul 79	Mission 4386, designated LBRV-1 (Large Ballistic Recovery Vehicle-1), a BMO/ABRES research and development mission.
10 Jun 79	Mission 6800, a TITAN III-C satellite insertion mission. KMR provided telemetry and communication support.
7 Jul 79	Mission 4386, designated LBRV-1 (Large Ballistic Recovery Vehicle-1), a BMO/ABRES research and development mission.
10 Jul 79	Missions 2966/1713, two MINUTEMAN III's, designated GT-40/GT-68, SAC operational tests launched in SALVO.
16 Jul 79	Mission 4030, designated GIANT MOON, a SAC Emergency Rocket Communication System (ERCS) launched by a MINUTEMAN II.
17 Jul 79	Mission 4145, a Terrier/Malemute, launched from Roi-Namur in support of the Defense Nuclear Agency (DNA) ionosphere plume experiment.
23 Jul 79	Mission 7050, a Terrier/Malemute, launched from Roi-Namur in support of the DNA ionosphere plume experiment.
27 Jul 79	Mission 3161, designated GT-69GB, a SAC MINUTEMAN III operational test featuring three reentry vehicles with one targeted for land impact.
3 Aug 79	Mission 8300, designated STREP-II, the second MINUTEMAN I in a series of four dedicated missions for the Systems Technology Program.
22 Aug 79	Mission 3460, designated STM-18W (Special Test Missile), a BMO MINUTEMAN III metric and signature test. (The last of the STM series.)

22 Sep 79	Mission 5227, designated ABRV-2 (Advanced Ballistic Reentry Vehicle), a BMO/ABRES research and development mission.
26 Sep 79	Mission 6318, designated GT-138M, a SAC MINUTEMAN II operational test.
29 Sep 79	Mission 3818, designated GT-70GM, a SAC MINUTEMAN III operational test, the second in a series of eight land impact tests.
30 Sep 79	Mission 4673, a TITAN III-C satellite insertion mission. KMR provided telemetry and communication support.

CHAPTER III

PROGRAM AND RANGE PLANNING

The ever-increasing users' needs for more precise metric and position data, impact scoring, and meteorological measurement accuracies required increased managerial attention to modernization and improvement efforts by the range. The range users have shown great concern for lower trajectory coverage to aid in survivability studies for reentry systems. Telemetry lost on a reentry vehicle (RV) does not necessarily indicate RV demise, nor does an RV score necessarily mean that an RV survived. Studies and investigations pursued throughout the year continue to modernize and improve the range to meet the users' needs.

Range planning for the Mark (MK) 500 Penetration Aids (PENAIDS) program was started. This program consists of MINUTEMAN I's launched from the Western Space and Missile Center (WSMC), Vandenberg AFB, California, and MK 500 PENAIDS Sounding Rockets (short title "HAVE JEEP V") launched from Roi-Namur Island.

The effects of weather on Ballistic Missile Organization/Advanced Ballistic Reentry System (BMO/ABRES) research and development flight test programs continued to be a critical requirement on the range. The user's concerns are the influences of winds and density along an RVs path to the determination of target miss distance and vehicle drag coefficient models. Also of importance is the requirement to determine warhead erosion as it travels through a predetermined atmosphere. The range is required to measure meteorological parameters (winds, density, hydrometer content, etc.) with laboratory accuracies. BMO/ABRES programs which required these accurate meteorological measurements were: Technology Development Vehicle (TDV), Thrusted Replica Decoy (TREP), Advanced Nosetip (ANT), and the System Technology Missile (STM). The Reentry Environment Measurements Program (REMP) is designed to measure the hydrometeor content of the atmosphere RVs fly through and serves to support other BMO/ABRES programs. In FY 79 the total management responsibility for this effort was assumed by the Ballistic Missile Defense Systems Command (BMDSCOM) through the Kwajalein Missile Range Directorate (KMRD).

Planning continued for the support of the Homing Overlay Experiment (HOE), the Navy's TRIDENT I and Advanced TRIDENT, the Air Force's Missile X, and the NASA Space Shuttle.

Considerable effort was devoted to the planning of the lagoon surface recovery of BMO/ABRES payloads. Present KMR recovery procedures are to allow reentry vehicles to sink to the bottom of the lagoon. The range user requires the recovery of undamaged payloads which truly reflect the effects of reentry only. The Interim Recovery System (IRS) and the Large Ballistic Recovery Vehicle (LBRV) programs are examples of these requirements. Follow-on effort is planned as the Advanced Recovery System (ARS).

The Defense Nuclear Agency (DNA) continued their test program to obtain ionospheric scintillation information, utilizing ALTAIR and other sensors. Two such experiments were successfully conducted during this fiscal year.

The Ballistic Missile Defense Advanced Technology Center's Designating Optical Tracker (DOT) program continued to impose increasingly precise requirements on the range as the complexity of each mission increased. This program required highly precise and accurate planning to enable the range to fulfill its real-time objectives during the power flight and deployment trajectories of the sensor.

CHAPTER IV

REENTRY MEASUREMENTS RADARS

Modification to the Kiernan Reentry Measurements Site (KREMS) radars to enable Kwajalein Missile Range (KMR) to provide better support to programs using the range continued during FY 79. The most significant modification work is summarized below.

Target Resolution and Discrimination Experiment (TRADEX)

A new L-band Data Acquisition and Recording System (LDARS) was installed. The new LDARS provides a larger and faster sample memory, simplified memory control features, and the capabiltiies required for Multistatic Measurement System (MMS) modifications. A special monostatic range calibration loop, internal to the TRADEX receiver, was also implemented.

The coherent signal processor was expanded to handle four channels that include MMS remote site data, and new A/D converters operating at 30 MHz were installed in the metric channel.

Backscatter experiments from clear air turbulence were initiated at TRADEX to investigate the feasibility of remote wind measurements in the reentry corridor.

ARPA Long Range Tracking and Instrumentation Radar (ALTAIR)

The 50 microsecond narrowband pulse was operated with mixed results during this fiscal year. It was very useful for certain satellite operations where the extra energy was needed. It was not used often on Western Test Range (WTR) missions because of an increased crowbar rate while operating with this pulse. The problem was discovered to be the switch tube in the modulator portion of the transmitter, which is not as reliable as necessary for critical WTR missions. A changeover to another switching tube is planned and all components have been ordered.

A detailed inspection of ALCOR's radome was conducted to determine the effects of weather and salt water exposure. Serious structural weaknesses induced by salt water corrosion were found in three panels sent back to the Continental United States (CONUS) for testing. Refurbishment of the radome by recaulking all seams and replacing panels showing excessive corrosion is underway.

Multistatic Measurement System (MMS)

In FY 79, development and laboratory tests of the MMS subsystems were completed. These subsystems include two 6.1 m antennas, equipment shelters, analog microwave link antennas and filters, and a monitoring console. The equipment was shipped to KMR for installation at the remote islands of Gellinam and Illeginni, for interface with the KREMS radars following a brief checkout period of the subsystems on Roi-Namur, and the overall system field tests.

Test of the antennas indicated the achievement of the specified high-angle rate capability for near-overhead missile tracking. A stable timing loop through the analog link, capable of steady and high signal phase lock and clock synchronization, was established at the remote site. Initial signal processing through the receivers was demonstrated and console checkout for command, status and data displays was completed.

System checkout is continuing at KMR towards a projected MMS operational date of mid-year 1980.

CHAPTER V

RANGE TECHNICAL FACILITIES

TPQ-18 Radar

The TPQ-18 is a high-accuracy, long-range, C-Band instrumentation radar, built by RCA. The system at KMR is serial number one and was acquired from SAMTEC's Canton Operating Location, in 1975. Disassembly of the radar at Canton Island began 18 Oct 75. The radar arrived KMR 6 Dec 75. Site construction was completed atop Launch Hill on Kwajalein Island and system installation began 26 Apr 75. Installation and checkout phases required two months; initial calibration and operator training took another month; and the radar was declared operational on an Engineering Test Basis 16 Aug 76. The first instrumented RV mission (5688) was supported that date.

The radar was declared operational Mar 77. Plans were made to develop and upgrade the receiving portion of the radar from vacuum tube to solid state technology. As part of the upgrade activity, the computer was replaced in FY 79 and is now fully operational. Other modifications will begin in 1980 and will be completed in 1982.

Photo Optics

Super RADOT #3 was installed on Legan and declared operational during FY 79.

The addition of this system gives KMR three operational Super RADOT's to meet exoatmospheric coverage requirements.

X-Band Splash Detection Radar

Three X-Band SDR's were acquired from SAMTEC during FY 75 to better satisfy user requirements. The first SDR was installed on Gillinam and began operations 29 Sep 76. Performance evaluation tests were performed and the final report was published. Construction of the second SDR Facility began Apr 77 at Legan and was completed Aug 77. Performance evaluation tests were completed in Aug 79. Evaluation test data resulted in some additional work to improve the performance. This work has been completed and both radars are now fully operational. The third radar is being kept in storage and will be installed in the future.

Communications

The modernization program of the High Frequency Radio Receiver Facility which was scheduled for implementation in FY 79 was held in abeyance due to budget restraints imposed on the FY 79 program. This program is rescheduled for FY 82 and is designed to replace the manually tuned medium frequency - high

frequency receivers with remote controllable processor and receivers,with all receiver tuning and switching being accomplished from the Technical Control Facility.

The Digital Microwave System which was placed under procurement during FY 78 to support the USAF Land Impact Program and the Kwajalein Multistatic Measurements System (KMMS) was installed in FY 79. This system provides communications between the island of Meck and Roi-Namur as a contingency against loss of the submarine carrier system repeater from land impact testing and provides high speed data communications between Roi-Namur to Gagan, Illiginni, Gellinan, Meck , and Kwajalein to support KMMS and current range user requirements. At a future date, it is planned to extend the system to Ennylabegan, Legan, Omelak, and Eniwetak to take advantage of cost savings realized in direct interfacing the AN/FSC-78 satellite terminal digital communications subsystem to the total digital microwave system.

Telemetry Data Re-Rad System

A portable telemetry data reradiation system was installed on Illeginni in Jul 79 to support RV land impact test programs. The system receives S-Band telemetry signals from incoming RV's and retransmits the signals on L-Band to the main telemetry facility on Ennylabegan.

Refractivity Effects

During 1979, the range user requirements for special meterological support required at KMR for SAMSO/ABRES missions shifted from wind data to refractivity data. Concerted efforts were initiated to provide measurements of refractivity and to analyze the data from all KMR refractive measuring resources. These data are being investigated for possible use in correcting low angle metric radar tracking data to more accurately reconstruct the best estimate of trajectory (BET) of reentry vehicles.

Radio Frequency (RF) Measurements System

Due to age and cost of refurbishment, plans were made to phase out the Frequency Control and Analysis (FCA) facility at KMR. Plans to accomplish the FCA function within the Mobile RF Van were initiated. This will require procurement of additional hardware and modification to the Mobile RF Van. Partial procurement was made and market surveys were accomplished for other hardware.

Timing Systems

A Portable Time Measurement Unit (PTMU) was procured in FY 79. The PTMU was required to replace existing equipment which is old, unreliable and difficult to maintain. The PTMU is an integral unit having a recorder, counter, and clock. The PTMU will be used to certify timing accuracies at remote sites at KMR. Following final acceptance at KMR, additional units will be procured.

Range Instrumentation Systems Analysis

The Kwajalein Missile Range assures the performance and data accuracy of the range instrumentation sensors through a continuing test and analysis program. This effort is performed by the Range Instrumentation Systems Analysis (RISA) group under the direction of the Range Development and Communications Division. KMR Instrumentation performance and data accuracy was monitored on a continuing basis resulting in consistently high KMR data quality for FY 79. Semi-annual reports documenting this data quality were published for trajectory, timing, and impact instrumentation. In addition to these reports which are distributed to the KMR range user community, KMR performance and accuracy presentations were made to the Joint Range Instrumentation Accuracy Improvement Group and other professional and user groups.

The RISA group conducts Performance Evaluation tests to establish baseline instrumentation behavior. This serves as a reference for the performance and accuracy monitoring program. Performance evaluation testing also establishes instrumentation certification enabling range users to use KMR instrumentation data with confidence. In FY 79, Performance and Evaluation tests were conducted on the Range Meteorological Sounding System, two Super RADOTs and two Splash Detection Radars. Certification was established on all these systems except the Range Meteorological Sounding System.

To assure that high quality instrumentation is developed in the most efficient manner, the RISA group participates in all instrumentation development efforts as appropriate. The most significant effort of this type during FY 79 was support for the Super RADOT system development. The RISA workload to support this program was significant enough to require relocation of an analyst to the Honolulu Data Reduction Facility. Areas under investigation include MARS analysis pedestal servo improvement, calibration procedure improvement and total system integration.

Other highlights of the year's activity were:

Sensitivity analyses of the wind determination algorithms for both the GMD and RMSS Systems were conducted and published.

The Dual-Doppler Wind-Finding concept was supported by RISA. A plan was produced for testing the concept at White Sands. Techniques were proposed for presenting the derived wind component data and modifications for the hardware and software were defined.

Computer programs were developed for the local processing of raw MPS-36 data tapes and final multisensor trajectory data tapes, which enables acquisition of the data for further statistical and analysis processing. A similar effort was begun for TPQ-18 tapes.

KMR efforts to implement the Phase-Derived-Range (PDR) technique were initiated and supported by numerous studies including: PDR concept and KMR benefits, hardware configuration, and software processing and presentation.

Support was provided in the definition of calibration satellite applications and radar transponder specifications.

A KMR timekeeping accuracy report was produced covering the period of Oct 75 through Dec 78.

A qualitative and quantitative review of TPQ-18 skin tracking data was conducted and recommendations made for mission support.

Analyses of test and mission radar data were performed in order to better determine the proper methods for application of the monopulse angle corrections.

CHAPTER VI

RANGE SAFETY

The Range Safety mission is to insure that all reasonable precautions consistent with operational requirements will be taken during the preparation and conduct of missile and other hazardous operations to prevent injury or damage. Range Safety for all such operations at the Kwajalein Missile Range is the responsibility of the National Range Commander, who discharges this responsibility through the Director, Kwajalein Missile Range Directorate. This responsibility is carried out by the KMRD Safety Office located in Huntsville, Alabama, and the KMR Range Safety Office located at Kwajalein, Marshall Islands. The KMRD Safety Office develops all Range Safety policy and criteria that apply to hazardous operations at KMR and is responsible for long-range planning and negotiations with potential Range Users. The KMR Range Safety Office is responsible for insuring that all established criteria are followed and for providing operational Range Safety support during missile operations.

During FY 79, the following events occurred in the Range Safety area:

In Sep 79, plans to certify the Kwajalein Range Safety System (KRSS) against the design requirements established by the government were finalized.

After two years, the Laser Infrared Tracking Experiment (LITE) continues to operate without incident. This one joule per pulse laser radar system is operated for ATC by Lincoln Laboratory who designed the system wtih fail-safe safety interlocks. Refinements have been added to the control system further enhancing data gathering ability.

A second laser tracking system has been installed on Roi-Namur. Like the LITE system, the Mobile Laser Tracking System (MOBLAS) uses a one joule ND:YAG laser. However, it uses a frequency doubler providing visible light in the green spectrum. The higher frequency permits more refined range resolution. The MOBLAS is operated by the Bendix Corporation for NASA as part of an international effort to study earth crust dynamics by gathering satellite range data at various sites around the world. Some of the approaches taken on LITE were employed on MOBLAS to insure safe operation.

During 1979, the Marshallese leadership placed some emphasis on determining the environmental effects of materials carried on reentry vehicles (RV's) impacting in the Kwajalein Lagoon. The major concern was the potential toxic and low-level radioactivity of depleted uranium carried on some RV's. After briefing the Marshallese leadership and their legal counsel, a short-term environmental monitoring effort was executed. Sample analysis results to date indicate uranium concentrations that would not pose any health or safety hazard. A longer range environmental monitoring effort which will include marine life samples has been developed and will be executed during 1980.

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CHAPTER VII

MAJOR CONSTRUCTION ACTIVITIES

This chapter discusses the major construction activities for FY 79. This includes construction under MCA and RDT&E Appropriations, Plans & Programs.

Sewage Treatment Plant - Kwajalein Island

Funded for $6.943M in FY 79, the MCA Program provides for a modern primary and secondary treatment plant on Kwajalein and three separate collection and treatment facilities - septic tanks on Roi-Namur Island. Design drawings were reviewed by BMDSC-RE and modifications/revisions were incorporated into final drawings. On 11 Jan 79, a notice to proceed was issued to Martin-Zachry Constructors and accelerated construction on the Kwajalein Island Plant has been in progress since that date. On 29 Jan 80, the plant was about 50% complete. Scheduled completion date is 30 May 80.

Resurface Aircraft Parking Apron - Kwajalein Island

This FY 78 MCA project, funded at $2.6M, provided for repair of spalded concrete, overlaying with 4" of special asphalt, and sealing. Upgrading of aircraft tiedown and grounding points was accomplished. Storm drainage was improved. Project was completed in Jan 79.

Resize and Modernize Range Facility - FY 80 MCA

This FY 80 MCA project consists of a weather station addition, a new building for the TPQ-18 Radar Complex, an addition to the Launch Operations Control Building on Roi-Namur, Super RADOT facilities, and upgrading the KMR electrical distribution system. In Aug 79, 90% of the design drawings and specifications were reviewed and revision information furnished Pacific Ocean Division (POD) Corps of Engineers.

Restoration of Cargo Pier - Kwajalein Island

Damage caused by the 2-3 Jan 79 storm "Alice" was repaired at a cost of about $475,000. Extensive replacement of portions of concrete beams, decking, fender system and causeway were required. RDT&E funds were utilized for this project.

Army Pollution Abatement Facilities - Atoll Wide - FY 81 MCA

BMDSC-RE reviewed and furnished revision comments on the 90% complete design drawings in Oct 78. Construction of this project will comply with EPA Regulations for the remaining 12 waste discharge outfalls into lagoon/ocean not covered by FY 79 MCA.

BMDSC-RE also reviewed design drawings and furnished revision requirements to POD for the following FY 81 MCA Projects:

Barracks Modernization

Marine Shop

Live Explosive Facility - Roi-Namur

Pollution Abatement Facility

Homing Overlay Experiment (HOE)

Completed criteria for Meck Island launch complex for HOE.

CHAPTER VIII

BASE SUPPORT ACTIVITIES

General

The Kwajalein Missile Range (KMR) nonindigenous population was 2980 at the end of FY 79. This is 162 less than the population at the end of FY 78.

The Kwajalein Missile Range continued to consolidate facilities to ensure efficient utilization and to conserve energy. Intensive new efforts in this area are planned for FY 80 with dedicated personnel assigned to perform the effort.

Special support of Trust Territory of the Pacific Islands (TTPI) by the Logistic Support Contractor (approved in FY 78) was concentrated in the area of rehabilitation of Government-constructed housing units.

Logistic Support

Several major revisions to the KMR LSC (Global Associates) Scope of work SW-K-2-74 were finalized during this period. Also a new logistic support contract (Contract No. DASG60-80-C-0001) was awarded to Global Associates for a three-year period beginning 1 Oct 79.

During FY 79, the LSC ceased operations with one of two L-188 Electra aircraft in support of prime shift passenger service between Kwajalein and Roi-Namur Islands. Budget constraints together with a reduction in Meck Island activity (in FY 81) made possible the elimination of this one Electra. A significant contribution to this decision was the inordinately high (unexpected) Inspect and Repair As Necessary (IRAN) costs for the other L-188 aircraft which was completed in July 1979. The KMR fixed wing fleet now consists of one L-188 and four Caribou aircraft.

A C-7A aircraft accident occurred during landing at Meck Island on 15 Aug 79. No injuries occurred; however, major structural damage necessitates action to seek a replacement from Air Force resources at Davis Monthan AFB, Arizona.

Two replacement tugs (overhauled at Sharpe Army Depot) arrived at KMR in May 79. The two tugs previously assigned to KMR were returned to Sharpe Army Depot for overhaul and presumedly storage.

An exchange wherein the three Landing Craft-Medium (LCM-8's) at KMR went to the Air Force at Wake Island and three new LCM's were provided KMR from Sharpe Army Depot was completed. The Air Force paid all transportation costs for this exchange.

Administrative use vehicles (AUV) allocated from FY 78 procurement actions were delivered to KMR during this period. FY 79/80 requirements were submitted to the U.S. Army Tank-Automotive Materiel Readiness Command (TARCOM) and initial indications (based on DA budget constraints) were that allocations for FY 79

would only be 11.9 percent and FY 80 requirements would be about 5.5 percent of actual programmed requirements. Intensive management actions by both TARCOM and BMDSCOM have resulted in significant improvements in these projections. Allocations for FY 78 and FY 79 were increased to 69.4 and 41.6 percent, respectively. Additional actions currently in process between TARCOM and BMDSCOM should increase FY 79 allocations to approximately 50 percent and FY 80 allocations to 40 percent.

A requirement for 13 motor scooters (3 or 4 wheeled, gasoline driven) was placed on TARCOM for FY 78. TARCOM approved nine for FY 78, two for FY 79, and one for FY 80 procurements. These items are currently under contract (through GSA) and, when delivered, will be used to replace a like number of pickup trucks currently in use at KMR. Future requirements for additional scooters will be based on results of a 6-12 month usage data study at KMR.

A minimum utilization program (implemented during FY 78) continued during FY 79 with the objective of minimizing and reducing, where possible, vehicle and equipment requirements at KMR. This program established a 200 mile per month utilization (maximum unless specifically approved as mission essential by the CO, KMR) requirement for vehicles, with a quarterly review of justification/ requirements for those not meeting this standard. Several Class B dispatch vehicles were changed to Class C, and these vehicles have been reviewed as candidates for turn in. Data resulting from this program should continue to improve utilization of vehicles and should reduce total vehicle requirements.

The University of Hawaii, under contract to the LSC, completed a lens water study for Kwajalein Island. There appears to be an ample supply for the foreseeable future without the desalinization plant or the need of a reverse osmosis system. Additional lens wells could possibly be installed rather rapidly if required.

The Straddle Carrier Modification Program (started in FY 78) was completed during FY 79 with both units fully operational. This major modification was accomplished by the LSC automotive section.

Megger testing results of the electrical distribution system were received from Facilities Engineering Support Agency (FESA) and a plan was developed for replacing feeder cables. No cables were replaced during FY 79 due to lack of funds. Recommended relay settings for protective devices were received from FESA and the relays were reset. Also an infrared survey of electrical systems was performed by FESA and the splices/connectors showing "hot spots" were improved on.

The Energy Conservation Program, which began in FY 74, continued to progress during FY 79. Overall consumption was 9.2 percent below the FY 75 baseline. Approximately 90 percent of the recommendations made by the survey team (Feb 78) have been implemented. Advice has been received that the overall Army conservation goal for FY 80 would be about one percent below the FY 79 fuel consumption. Individual command/installation goals are in the process of being determined by the Department of the Army.

The LSC completed facilities engineering projects during FY 79 totaling $240,648 for construction; $1,005,302 for repair; $111,672 for equipment-in-place; $1,897 for fabrication; $29,928 for minor individual construction jobs; and $152,137 for range user technical support. The most significant facility engineering project approved during FY 79 was for the construction/installation of the Multistatic Measurement System/Digital Microwave System on Illeginni.

The nine diesel engines in Power Plant No. 1 at KMR operated approximately 90,000 hours without a major overhaul. After an inspection, a Cooper-Bessemer engineer recommended a major overhaul on all nine engines. The concept for this project was approved and is scheduled to be completed within the next two or three years. Two engines were overhauled during FY 79 and a third engine was almost completed (approximately 95 percent).

Efforts to upgrade the bulk fuel storage and distribution system continued during FY 79. Repairs to the petroleum lines to the fuel pier were completed, and repairs and modifications to fuel tanks No. 8 and 9 were completed. A changeover from JP-4 to JP-5 was accomplished in Feb 79.

The Logistic Support Contractor's FY 80 capital equipment procurement request was approved. This approval authorizes the contractor to acquire capital equipment to replace overage equipment now in use. A total of 28 items will be procured, with a value of $134,433.

Tripler Army Medical Center (TAMC) personnel performed a survey of the medical/dental operations at KMR during Mar 79. The overall comments provided by the team members were very laudatory as to the operations and staff. The team provided recommendations as to some areas which could be improved and/or equipment replaced to enhance operations. The majority of the recommendations were completed wtihin three months of the team's visit.

Fuel prices were increased at KMR (effective 1 Sep 79) for other than US Government agencies. The new prices are an approximate average of the commercial rates in the area and are deemed appropriate for this category of users. The prices will be reviewed quarterly.

KWAJALEIN MISSILE RANGE NON-INDIGENOUS POPULATION - 30 SEP 79

Kwajalein Island		
Commanding Officer, Kwajalein Missile Range and Staff		47
Systems Technology Program Contractor (MDAC)		73
Kiernan Reentry Measurements Site		149
Control Data Corporation		21
Pacific Ocean Division, US Army Corps of Engineers		6
Construction Contractor		82
Logistic Support Contractor		820
Technical Support Contractor		286
Defense Mapping Agency Topographic Center		2
Trust Territory of the Pacific Islands		2
Federal Aviation Agency		5
Defense Contract Audit Agency		1
Ballistic Missile Defense Operations Office		3
Department of Energy/Brookhaven National Laboratory		3
Dependents		1,169
Transients		16
	SUBTOTAL	2,685
Roi-Namur Island		
Stanford Research Institute		9
Logistic Support Contractor		142
Technical Support Contractor		9
Kiernan Reentry Measurements Site		79
Transients		1
	SUBTOTAL	240
Ennylabegan Island		
Logistic Support Contractor		7
Technical Support Contractor		14
	SUBTOTAL	21
Meck Island		
Logistic Support Contractor		9
	SUBTOTAL	9
Ebeye		
Logistic Support Contractor		25
	SUBTOTAL	25
	TOTAL	2,980

NOTE: Employed dependents not shown.

Table 6. (U) KMR Non-Indigenous Population

CHAPTER IX

KMR RELATIONSHIPS WITH THE TRUST TERRITORY AND THE MARSHALLESE

Roi-Namur

On 15 Sep 78, approximately 60 Marshallese (men, women, and children) moved to Roi-Namur Island. A spokesman for these people indicated that they had moved to Roi-Namur because they had not been compensated for use of the island, and that they intended to stay until settlement was reached.

During the period 15 Sep to 7 Nov 78, all efforts by the Trust Territory of the Pacific Islands, the Marshallese traditional leaders, and U.S. Army representatives to cause removal of the people were unsuccessful. During this period, the number of Marshallese occupying Roi-Namur fluctuated from 60 up to 200.

On 8 Nov 78, U.S. Army representatives met with the people at Roi-Namur and the people agreed to vacate the island based upon commitment by the High Commissioner, Trust Territory of the Pacific Island (HICOM, TTPI) to provide continuing subsistence to them, utilizing U.S. Department of Agriculture (USDA) food provided to the TTPI under the Needy Family Feeding Program. The U.S. Army also agreed to provide some subsistence items pending setup of the TTPI feeding program. The Marshallese people occupying Roi-Namur returned to their homes on Ennubirr and Ebeye Islands, 9 Nov 78. The U.S. Army provided 500 lbs. of flour, 500 lbs. of rice, and a variety of other foodstuffs to these people from existing stocks.

The Roi-Namur people (approximately 200) began receiving monthly allocations from the USDA-provided commodities in late January 1979.

In early Jun 79, the attorney for the Roi-Namur landowners was offered $1.6M by the U.S. Government (Navy) for past and future use (1981) of the island. The landowners refused this offer and did not propose a counteroffer.

Beginning 20 Jun 78, the Chairman of the Kwajalein Landowners' Committee (Ataji Balos) dispatched a series of messages to the Secretary of Defense requesting immediate high level discussions with his committee in regard to Roi-Namur (and Kwajalein) problems. The Department of Defense (DOD) response to these requests was that "DOD stood ready to resume negotiations on the Roi-Namur Island lease at the convenience of the landowners."

On 20 Jul 79, approximately 33 Marshallese occupied a portion of Roi-Namur (other KMR Islands were also occupied), and their leaders advised that they would remain there until compensated for past and current use of the island by the U.S. Government.

During the period 21 Jul to 6 Aug 79 agreement was reached between the Government of the Marshall Islands (GOM) and the DOD to meet in Washington, D.C., in Sep 79, on a government-to-government basis, with the principal objective being to devise an interim agreement for the pre-termination period, including settlement of the Roi-Namur lease. The location for this meeting was subsequently changed to Honolulu, Hawaii, and would include participation by the Kwajalein Landowners Committee.

During the negotiation session (26 Sep 79) in Honolulu, Hawaii, the Kwajalein landowners position was that past use payment for Roi-Namur should be $3,429,549. The DOD position was that this amount was not justifiable, and that settlement of the Roi-Namur lease would require further negotations. A meeting between the DOD and GOM was set for 18 Nov 79 to continue negotiations relative to Roi-Namur lease and other Kwajalein Atoll Use and Occupancy Agreements.

Future Political Status

During the period Jul - Apr 79 the Marshall Islands Political Status Commission developed a Marshall Islands Constitution (approved by a referendum by the Marshallese, and subsequently approved by the U.S. Government); held an election for the Marshall Islands Nitijela (Congress), which elected Amata Kabua as President of the Government of the Marshall Islands. President Kabua assumed office 1 May 79, appointed his cabinet, and the GOM become a self-governing political entity performing functions delegated by Department of Interior Order 3039.

As of 30 Sep 79 periodic negotiations between the U.S. Government and the GOM on a post-trusteeship Compact of Free Association had resulted in agreement on several major issues. However, level of U.S. funding during the 15-year term of the Compact, GOM access to U.S. Court System on environmental matters, taxation of U.S. personnel in the Marshalls, and the development and consummation of a Status of Forces Agreement and an Operating Rights Agreement (to become a part of the Compact) remained to be resolved.

Trust Territory Civil Action 294/20-78

The 25 Oct 78 trial date for this long-standing Trust Territory of the Pacific Islands (TTPI) condemnation suit, involving the islands of Eniwetak, Omelek and Gellinam, was subsequently rescheduled for 13 Feb 79 at Majuro, Marshall Islands.

In Oct 78 the TTPI Court permitted the landowners to draw the funds on deposit ($50,000) in this case, pending determination of a fair and equitable lease value.

The continued case was heard by Judge Hefner on 13-15 Feb 79. Professor Lewis Frietas, University of Hawaii, testified as an expert witness for the landowners that the past and future use (to 1981) value of the land was $976,000 plus interest. The Government's expert witness, professional appraiser, Mr. Griffin, testified that the value of the property was $45,000 for the same time period.

By Memorandum Opinion, dated 23 Mar 79, Judge Hefner concluded that a fair and just compensation due the landowners was $146,875 (1 Apr 66 to 2 May 78 - $54,375; 2 May 78 to 31 Dec 81 - $92,000) less the amount previously drawn by the landowners from the Government's deposit. This Opinion directed the TTPI Government to prepare a judgment, consistent with the Opinion, along with a Certificate of Title pursuant to the TTPI Code, and directed the landowners to file a "cost bill" to serve the Government counsel.

By letter, dated 3 Apr 79, the TTPI Special Counsel advised Judge Hefner of a mathematical error in Judge Hefner's Memorandum Opinion. The total judgment for future use of the islands (2 May 78 to 31 Dec 81) should have been $82,500 vice $92,000, thereby reducing the total judgment to $136,875 plus interest and other allowable costs.

On 17 May 78, the TTPI Special Counsel received a cost bill from the landowners attorney. This bill, including award, interest, attorney fees, appraisal costs, expert economic evaluation, and travel and lodging expenses for landowners representatives and attorney, totaled $425,539.

The TTPI Government issued judgment in this Civil Action Case on 17 Jul 79. Judgment included award of interest in the amount of $43,705.34 and costs in the amount of $10,475.00. Total amount required for satisfaction of the judgment was $142,863.34 as of 17 Jul 79. This amount was to be paid to the landowners' counsel within 90 days of the judgment or the order of possession would be rescinded.

On 19 Sep 79, the Pacific Ocean Division, Corps of Engineers transmitted $144,858.70 (included interest from 17 Jul 79) to the Navy Facilities Engineering Command, Hawaii, for further transmittal to the TTPI Government and the landowners.

Marshallese Occupations of KMR Islands

Marshallese Kwajalein Atoll landowners instigated the occupations of several islands leased or otherwise secured by the U.S. Government. These occupations were staged ostensibly to bolster the landowers' advocacy of immediate renegotiation with DOD of all the leases and agreements which provide for KMR use and occupancy within the Kwajalein Atoll. The islands affected by these occupations were:

Eniwetok, Omelek - Occupied periodically by Handel Dribo family (6-25 people), who have land rights on these islands. The Marshallese agreed to be evacuated on several occasions to permit meteorological rocket firings, but on other occasions refused to evacuate, requiring firing of the rockets from another location.

Roi-Namur - Occupied by Marshallese people (30-200) from Ebeye and Ennubirr Islands during the periods 15 Sep - 9 Nov 78 and 20 Jul - 21 Aug 79. These people evacuated 9 Nov 78 after the HICOM, TTPI, agreed to provide USDA food

on a continuing basis to approximately 200 people. The 21 Aug 79 evacuation resulted from agreement between DOD and the GOM to negotiate an interim agreement for KMR "use and occupancy" rights in the Kwajalein Atoll.

Baggeratjan - Occupied periodically during Jun 79 by one Marshallese family (3-10 people). Evacuated by KMR TTPI Liaison Officer, with assistance from the landowners of the island and the GOM's representative, Kwajalein.

Kwajalein - On 20 Jul 79, approximately 70 Marshallese occupied a small area on Kwajalein Island. The number of Marshallese increased daily until approximately 500 were encamped throughout the island. These Marshallese evacuated Kwajalein on 6 Aug 79 after agreement by the GOM and DOD to initiate negotiations for an interim Use and Occupancy Agreement.

Bigej - Occupied during same period as Kwajalein. Number of Marshallese occupying this island fluctuated between 10 and 50.

CHRONOLOGY

Oct 78	Marshallese inhabit Roi-Namur Island as first of a series of island occupations to force a settlement for compensation of land use.
Jan 79	Tropical storm "Alice" struck atoll causing estimated one million dollars damage. Echo Pier and lagoon shoreline suffered extensive damage.
	Kwajalein Island aircraft parking apron resurfacing completed.
	Sewage treatment plant construction begun.
Mar 79	Straddle Carrier (lifting equipment) Modification Program completed.
	Medical/dental operations survey performed by Tripler Army Medical Center personnel.
Jun 79	Super RADOT No. 3 (of 5) declared operational.
	Upgraded computer operational in TPQ-18 Radar.
Jul 79	Portable telemetry data reradiation system installation completed.
Aug 79	Performance evaluation tests completed on second Splash Detection Radar.
Sep 79	Antenna, equipment shelter, and monitoring console subsystems of the Multistatic Measurements System completed development and testing.
	Kwajalein Range Safety System certification plans completed.

GLOSSARY OF ABBREVIATIONS (ACRONYMS)

ABRES	Advanced Ballistic Reentry System
ABRV	Advanced Ballistic Reentry Vehicle
ALCOR	ARPA Lincoln C-Band Observable Radar
ALTAIR	ARPA Long Range Tracking and Instrumentation Radar
ANT	Advanced Nose Tip
AOS	Army Optical Station
ARPA	Advanced Research Projects Agency
ARS	Advanced Recovery System
AUTOVON	Automatic Voice Network
BMDATC	Ballistic Missile Defense Advanced Technology Center
BMDSCOM	Ballistic Missile Defense Systems Command
BMDOPS	Ballistic Missile Defense Operations Office (KMR)
BMDSTP	Ballistic Missile Defense Systems Technology Program
BMO	Ballistic Missile Organization
DA	Department of the Army
DMSP	Defense Meteorological Satellite Program
DNA	Defense Nuclear Agency
DOD	Department of Defense
DOT	Designating Optical Tracker
ERSS	Earth Resources Support System
ETR	Eastern Test Range
FSM	Federated States of Micronesia
FY	Fiscal Year

GDOP	Geometric Dilution of Precision
GMD	Ground Measuring Device
GOM	Government of the Marshall Islands
HEAO	High Energy Astronomy Observatory
HITS	Hydroacoustic Impact Timing System
HOE	Homing Overlay Experiment
ICBM	Intercontinental Ballistic Missile
IRIG	Interrange Instrumentation Group
IRS	Interim Reentry System
ITTP	Interceptor Technology Testbed Program
KMR	Kwajalein Missile Range
KMRD	Kwajalein Missile Range Directorate
KREMS	Kiernan Reentry Measurements Site
KRSS	Kwajalein Range Safety System
LBRV	Large Ballistic Recovery Vehicle
LDARS	L-Band Data Acquisition and Recording Data System
LITE	Laser Infrared Tracking Experiment
LSC	Logistic Support Contractor
MCA	Military Construction, Army
MMS	Multistatic Measurements System
MOBLAS	Mobile Laser System
MSV	Miniature System Vehicle
NASA	National Aeronautics and Space Administration
PDR	Phase Derived Range
PRB	Pacific Radar Barrier

PVM	Production Verification Missile
PTMU	Portable Time Measurement Unit
RADOT	Recording Automatic Digital Optical Tracker
RSC	Range Safety Center
RDTE	Research, Development, Test, and Evaluation
REMP	Reentry Environment Measurements Program
RF	Radio Frequency
RISA	Range Instrumentation and Systems Analysis
RMSS	Range Meteorological Sounding System
RV	Reentry Vehicle
SAC	Strategic Air Command
SAMTEC	Space and Missile Test Center
SDR	Splash Detection Radar
SOFT	Signature of Fragmented Tanks
SOI	Space Object Identification
SPADATS	Space Detection and Trailing Systems
STM	Special Test Missile
STREP	System Technology Reentry Experiments Program
TDV	Technology Development Vehicle
TRADEX	Target Resolution and Discrimination Experiment
TREP	Thrusted Replica Decoy Program
TTPI	Trust Territory of the Pacific Islands
USAF	United States Air Force
UHF	Ultrahigh Frequency
VAFB	Vandenberg Air Force Base

VHF	Very High Frequency
VMARS	Video Metric Analysis and Reduction System
WSMC	Western Space and Missile Center
WTR	Western Test Range

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