

## CONTRACT REFERENCES

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### 45. National ICT Backbone Feasibility Study 1853

**Service Type:** Consulting  
**Location:** Rwanda  
**Client:** Trade & Development Agency/Rwanda Development Board  
**Contract Date:** 11/9/10  
**Performance:** 2/11 – 6/11

**Project:** Since 1996, Rwanda has experienced steady economic recovery, as a result of foreign aid and significant governmental reforms. However, private investment remains low despite an open trade policy, a favourable investment climate, and abundant labor, tax incentives to businesses, stable internal security and relatively low crime rates.

The Rwandan Government (GOR) is moving quickly on its plan to make the information and communications technology (ICT) sector a major economic contributor. In this regard, the GOR is committed to pursuing new business models and an organizational structure for managing the national ICT infrastructure that will encourage an open, non-discriminatory communications regime and ensure that capacity is available to all at fair prices.

**Tasks Performed:** This Feasibility Study of the Rwanda Communication Infrastructure Backbone Project has the overall objective of increasing accessibility of Rwanda to the global backbone communications network by providing high speed broadband connectivity. Through a competitive tender, ASTRO Systems was selected to carry out this Technical Assistance comprising the following tasks:

- Task 1: Background Research and Review of World Bank Study
- Task 2: Market Analysis
- Task 3: Business, Management and Financing Model
- Task 4: Adaptation of Technical Design and Project Implementation Strategy
- Task 5: Regulatory Framework
- Task 6: Development Impact Assessment
- Task 7: Preliminary Environmental Impact Assessment

### 44. PBC MF Transmitters 2063

**Service Type:** Installation Services  
**Location:** Pakistan  
**Client:** Harris  
**Contract Date:**  
**Performance:** 7/10 - Ongoing

**Project:** Provide two solid state MF transmitters on a turnkey basis to Pakistan Broadcasting Authority.

**Tasks Performed:** Install and commission 100 kW MF transmitter in DI Khan and 400 kW MF transmitter in Peshawar. Work included performing site survey, delivery of equipment from port, installation, check-out and proof-of performance testing of transmitters, air and liquid cooling

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system, HV primary power interface, automatic voltage regulators, standby generators, air conditioning, ½ wave vertical radiator, radiator coaxial transmission line, antenna tuning unit, grounding system, programming interface and programming conditioning equipment. Vertical radiator (398' and 696' high) scope included soils analysis, construction of foundations and rigging of towers. Site survey included developing antenna and transmission line placement plans, equipment installation plans and site and building renovations plans. Perform factory acceptance tests. Provide life support and security for installation team.

### **43. Preliminary Assessment of Records & Info Systems 2077**

**Service Type:** Consulting  
**Location:** Rwanda  
**Client:** Ministry of Justice  
**Contract Date:** 14 May 2010  
**Performance:** 5/10 – 1/11

**Project:** The main aim of the study was to assess the existing records and information systems in the Justice sector, diagnose where changes are needed, and propose a roll-out plan for the implementation of an integrated Sector Management Information System.

**Tasks Performed:** The study involved 14 government institutions, and main activities included the assessment of information wealth, inventory of data assets, and desired information flows within each unit and among sector institutions. The final report represented a roadmap to establish an efficient MIS that will increase information accessibility and integration, and provide for efficiency in processes and data systems.

### **42. ACRE Statewide Broadband Project 1983**

**Service Type:** Consulting  
**Location:** Brazil  
**Client:** US Trade & Development Agency/State of Acre, Brazil  
**Performance:** 12/09 – 12/10

**Project:** The State of Acre in Brazil has launched the Floresta Digital® Network Project to provide broadband internet services to all the main cities in the state, which is located in a remote corner of the Amazon and is one of the least developed regions in Brazil. Most towns are located near riverbanks, and rivers are the main means of transportation in the State. Through a competitive tender, ASTRO Systems was selected to conduct a feasibility study on the proposed project. Due to the unique geography, the project will provide a virtual infrastructure connecting rural and urban communities to both Brazilian and global markets. The project is closely associated with parallel initiatives to develop more efficient e-government services.

**Tasks Performed:** Main activities carried out include: 1) a needs assessment for the project, 2) review of the legal/regulatory framework, 3) network architecture design and functional specifications, 4) economic and financial evaluation of the project, 5) organizational structure and human resources issues, 6) preliminary environmental impact evaluation, 7) developmental

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impact assessment, 8) project implementation plan, and 9) bidding documents for all goods and services.

### **41. AFN Up Link Station 1942**

**Service Type:** EF&I  
**Location:** Mannheim Germany  
**Client:** Defense Information Communications Agency  
**Performance:** 9/08 – 4/09

**Project:** EF&I communications satellite earth station for television service. Station includes 1.8 m antenna with remote control, 200 watt redundant HPAs, LNBS and digital modems. Project included designing and fabricating elevated platform antenna mount, providing system manual and personnel training.

### **40. VOA Up Link Station 1760T3**

**Service Type:** Engineering Services  
**Location:** Cairo Egypt  
**Client:** International Broadcasting Bureau  
**Performance:** 6/08 – 3/09

**Project:** Provide engineering services to install and commission communications satellite station for television service. Station included 3.8 m antenna, redundant 100 watt TWT transmitters, LNB, frequency converters and digital modems.

### **39. Relocated VOA Relay Station 1821**

**Service Type:** Engineering Services  
**Location:** Kuwait and Germany  
**Client:** International Broadcasting Bureau  
**Performance:** 7/07 – 7/08

**Project:** On a sub-contract basis, provide engineering, rigging and technician services to relocate VOA communication satellite services terminal from Ismaling, Germany to Kuwait City, Kuwait. Work included disassembly, packing, unpacking, installing and wiring four satellite antennas and 25 equipment racks of equipment. Antenna sizes ranged from 3.8 m to 13 m.

### **38. Tech Assistance for the Telecom Development Fund project 1802**

**Service Type:** Consulting  
**Location:** Afghanistan  
**Client:** USTDA/ATRA  
**Performance:** 10/07 – 4/09

**Project:** Assist the Afghanistan Telecommunications Regulatory Authority (ATRA) and indirectly

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the Ministry of Communications (MOC) in the area of Rural telecom development with particular focus on how best to implement and administer the Telecom Development Fund (TDF) as prescribed by the Telecom Law, so as to maximize the effectiveness of the TDF as an instrument for improving rural access.

Specific tasks include: 1) Survey and Assessment of Rural Telecom Development (RTD) Initiatives; 2) Assessment of the Current Situation in Afghanistan; 3) Legal/Policy/Regulatory Review; 4) Evaluation of Key RTD Technological Solutions, Architectures, and their Attendant Economics and Risks/Benefits; Identification of U.S. Based Suppliers; 5) Review and Evaluation of RTD Business and Funding Models; 6) Development of Recommendations on Optimum Utilization of TDF; 7) Elaboration of Strategies and Mechanisms for Incentivization of RTD; 8) In-County Presentation and Workshop; and 9) Draft and Final Report.

### **37. CTNET Voice and Data Network**

**1803**

**Service Type:** EF&I and O&M  
**Location:** Iraq  
**Client:** ICTC  
**Performance:** 6/1/07 – 6/30/08

**Project:** Engineer, furnish and install a data network and telephone service for 400 users at ICTC Bureau, Headquarters, Ministry of Defense, Regional Headquarters at Al Asad, Baghdad, Basra, Mosul; and 18 provincial capitals. Complete network is established to provide encrypted VPN to provide protection equivalent to US DoD SIPRNET. Enclaves interconnected by provided fiber optic cabling and VSAT services. System equipment includes over 100 miles of cabling, redundant server farms, distribution data switches, routers and firewalls, full Cisco based VOIP and VTC, large UPS and generator backup. O&M includes training of Iraqi engineers, and maintenance of multiple enclaves, help desk and maintenance of all provided equipment and cable plant.

### **36. TVRO Maintenance**

**1725**

**Service Type:** System Maintenance  
**Location:** VOA Maintenance Groups 1, 3,4 and 6  
**Client:** International Broadcasting Bureau  
**Performance:** 10/1/06 – 9/30/11

**Project:** Provide maintenance and logistic support for existing Ku-Band and C-Band TVRO terminals throughout Western and Eastern Europe, Africa, Asia and Southwest Asia. Total of 150 sites are maintained on an annual basis. Systems range from 1.8 meter to 7.0 meter diameter antennas with multiple receivers which include an interactive video teleconferencing (VTC) network. Also furnish site surveys to determine viable locations for new TVRO sites; relocate and rebuild terminals. Performance period is 2006 to 2011.

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### 35. PSMR Web Site Support 1719

**Service Type:** EF&I  
**Location:** Iraq  
**Client:** MNSTC-I  
**Performance:** 2006

**Project:** Engineer, furnish and install a Web site to include web server with Internet connectivity via a VSAT terminal and Internet gateway station. Server to include specialize database operating on Oracle database application. Provide operation and maintenance of the facility.

### 34. NTM-I Voice and Data Network 1673

**Service Type:** EF&I  
**Location:** Iraq  
**Client:** MNSTC-I  
**Performance:** 5/04 – 12/05

**Project:** Engineer, furnish and install a data network and telephone service for 200 users at the NATO Training Mission Iraq (NTMI) Headquarters. Data services include NIPR, NATO UNCLAS, NATO CLAS, SIPR, and CENTRIXS.. Telephone service distribution is separate analog service cabling. Classified service distribution in fiber optic cable and unclassified distribution is UTP cable. Equipment includes all LAN components, fiber optic and UTP distribution switches.

### 33. CPATT Voice and Data Network 1637

**Service Type:** EF&I and O&M  
**Location:** Iraq  
**Client:** CPATT  
**Performance:** 11/04 – 10/06

**Project:** Engineer, furnish and install a data network and telephone service for 400 users at Adnon Palace and Phoenix Base, IZ. Data services include NIPR, SIPR, CENTRIXS, Iraq Government Network (IGN) and Iraq Secure Government Network (ISGN). System equipment includes over 100 miles of cabling, redundant server farms, distribution data switches, routers and firewalls, full JDIC approved DSN telephone switches, large UPS and generator backup. O&M include maintenance of multiple enclaves, help desk and maintenance of all provided equipment and cable plant.

### 32. CMATT Network 1584

**Service Type:** EF&I and O&M  
**Location:** Iraq  
**Client:** Collation Provisional Authority  
**Performance:** 2004

## CONTRACT REFERENCES

**Project:** Engineer, furnish and install a twenty-four station network in Iraq to provide communications to the fixed bases of the Iraq Armed Forces. Each station is interconnected by means of VSAT terminals configured to provide a non-blocking VPN with protected interface to the Internet. Each station consists of a network of personal computer workstations, file servers, printers. Network is protected by multiple firewalls. Network provides Internet access, file and email services and VOIP services. System managed and controlled from our NOC in Baghdad. Services include technical support to all stations for one year.

### **31. Broadcast Television 1580**

**Service Type:** EF&I and O&M  
**Location:** Iraq  
**Client:** International Broadcasting Bureau  
**Performance:** 2004

**Project:** Design and install television broadcast stations in Baghdad and Basra. Work included providing equipment shelters, power generators and installation materials for VHF television service. Subsequent to installation, we provided maintenance and operation services of the television stations.

### **30. Base Telecommunications Services 1496**

**Service Type:** System Maintenance and Operation  
**Location:** RAF Akrotiri, Cyprus  
**Client:** US Air Force Europe  
**Performance:** 2002

**Project:** Provide maintenance and operation services for base telecommunications services. This includes the Network Control Center, Local Area Network and telephone switching systems, transmission equipment, ancillary equipment, customer premise equipment.

### **29. TVRO Maintenance 1432**

**Service Type:** System Maintenance  
**Location:** VOA Maintenance Groups 1, 3, 4 and 6  
**Client:** International Broadcasting Bureau  
**Performance:** 10/1/00 – 9/30/06

**Project:** Provide maintenance and logistic support for existing Ku-Band and C-Band TVRO terminals throughout Western and Eastern Europe, Africa, Asia and Southwest Asia. Total of 150 sites are maintained on an annual basis. Systems range from 1.8 meter to 7.0 meter diameter antennas with multiple receivers which include an interactive video teleconferencing (VTC) network. Also furnish site surveys to determine viable locations for new TVRO sites; relocate and rebuild terminals.

## CONTRACT REFERENCES

### 28. International Private Line System 1383

**Service Type:** Maintenance & Operations  
**Location:** US, Germany and United Kingdom  
**Client:** SPRINT  
**Performance:** 1998 – 2002

**Project:** Operate and maintain a network of five communications satellite stations in US and Europe. Upgrade stations to provide continuous automatic satellite tracking and complete remote monitor and control. Stations are providing DS1 through DS3 service at C band. Antenna sizes range from 3.8 m to 9.3 m.

### 27. TVRO Installation 1362

**Service Type:** Installation Services  
**Location:** World-wide  
**Client:** United States Information Service  
**Performance:** 10/1/99 – 9/30/06

**Project:** Perform site surveys and install USIS TVRO stations throughout the world. This includes a five station network of dual service FM radio service stations and TVRO satellite program feeds in the major cities of Afghanistan. Work includes providing primary power generators, antenna towers, transmission lines, transmitters, program conditioning equipment in addition to the TVRO.

### 26. Communication System 1365

**Service Type:** Turn-key System Implementation  
**Location:** Sarajevo, Bosnia-Herzegovina  
**Client:** Ministry of Defense, Bosnia-Herzegovina  
**Performance:** 2000

**Project:** Design, install and test specialized communications equipment for the national military communications network.

### 25. Earth Station Maintenance 1307

**Service Type:** Maintenance Services  
**Location:** Washington, DC  
**Client:** Defense Information Systems Agency  
**Performance:** 1998

**Project:** Provide maintenance services for fixed and mobile Ku-band and X-band communications satellite earth stations for White House Communications Agency. Services include fault isolation and repair of equipment.

## CONTRACT REFERENCES

### 24. Earth Station 1305

**Service Type:** Turn-key System Implementation  
**Location:** U.S. Naval Academy, Annapolis, MD  
**Client:** U.S. Naval Academy  
**Performance:** 1999

**Project:** Design, install and test a communications satellite receive only earth station. Station included 7 meter antenna, complete receive electronics operating in C-band and Ku-band, as well as program track and auto-track antenna control servo. System included remote control via IPX LAN.

### 23. Voice Response System 1284

**Service Type:** Turn-key System Implementation  
**Location:** Multiple Locations in USA  
**Client:** U.S. Secret Service  
**Performance:** 1995

**Project:** Design, install and test an automatic voice response system for the identification of counterfeit currency.

### 22. INTELSAT Standard B Earth Station 1304

**Service Type:** Turnkey System Implementation  
**Location:** Diplomatic Telecommunications Service Terminal, Beltsville, MD  
**Client:** U. S. Department of State/Diplomatic Telecommunications Service  
**Performance:** 1996

**Project:** Engineer, furnish, install, and test, an 11 meter C-Band data terminal consisting of; redundant TWT HPAs, LNA, frequency converters, modems and fiber-optic interface to encryption systems, servo system, Earth Station Controller subsystem and retrofitting 11-meter antenna to dual circular polarized service. System provides world-wide transmission and reception of diplomatic telecommunications traffic. Remote monitor and control software developed by ASTRO.

### 21. Communications Satellite Terminal Maintenance 1306

**Service Type:** Task Order Services  
**Location:** Anacostia Naval Station  
**Client:** White House Communications Agency  
**Performance:** 1998

**Project:** Provide maintenance services for Ku Band and X Band Communication Satellite Earth Stations utilized by the President.

## CONTRACT REFERENCES

### 20. Computer Laboratory System 1285

**Service Type:** Turn-key System Implementation  
**Location:** Bolling AFB, DC  
**Client:** U.S. Air Force  
**Performance:** 1992

**Project:** Design, install and test a computer crime laboratory. Included provisioning of numerous multiple operating system work stations and several LAN's a firewall and WAN fiber optic, T1, ISDN BRI and ISDN PRI interfaces.

### 19. TVRO Installation 1267

**Service Type:** Installation Services  
**Location:** World-wide  
**Client:** United States Information Service  
**Performance:** 1994 - 1999

**Project:** Perform site surveys and install USIS TVRO stations throughout the world.

### 18. TVRO Maintenance 1294

**Service Type:** System Maintenance  
**Location:** VOA Maintenance Groups 1, 3 and 4  
**Client:** United States Information Agency  
**Performance:** 1994 - 1999

**Project:** Provide maintenance and logistic support for existing Ku-Band and C-Band TVRO terminals throughout Europe, Africa, and Asia. Total of 150 sites are maintained on an annual basis. Systems range from 1.8 meter to 7.0 meter diameter antennas with multiple receivers which form part of an interactive teleconferencing network. Also furnish site surveys to determine viable locations for new TVRO sites.

### 17. DS-3 Communications System 1223

**Service Type:** Turnkey System Implementation  
**Location:** Suitland, Maryland  
**Client:** Department of Commerce/NOAA  
**Performance:** 1992

**Project:** Engineer, furnish, install, and test a 23 GHz DS-3 microwave radio system used to interconnect the World Weather Building to Federal Office Building No. 4. The system includes a DS-3 multiplexer and LAN bridges for WAN for weather forecasting.

## CONTRACT REFERENCES

### 16. Surveillance System 1232

**Service Type:** Turnkey System Implementation  
**Location:** Cairo, Egypt  
**Client:** United States Agency for International Development  
**Performance:** 1993

**Project:** Engineer, furnish, install, test, and maintain a Closed Circuit Television System, PABX and UHF fixed/mobile radio system. CCTV consists of multiple remotely-controlled or fixed camera sites interconnected to a control center via a 23 GHz microwave radio system. Camera sites employ integrated ultra-high power infrared illuminators. PABX system provides analog and digital connections to all Egyptian Government ministries and the US Embassy. The radio system provides multi-channel coverage of the extremely large multi-runway airport facility. Provide maintenance for all equipment for two years after installation.

### 15. Video Teleconferencing System 1011

**Service Type:** Engineering Services  
**Location:** International  
**Client:** Commercial  
**Performance:** 1987

**Project:** Preparation of technical specifications equipment arrangement and interconnection for a command and control video teleconferencing system. Our Services included the development of specifications, configuration design, acceptance test procedures, operating procedures, system manual and interconnection drawings. Tasks included providing initial on-site installation and operation assistance/guidance. Equipment included video teleconferencing equipment, hubbing and C-Band communications satellite earth stations that included fiber optic interconnection as part of the circuit termination equipment.

### 14. Television Studio 1137

**Service Type:** Turnkey System Implementation  
**Location:** Ft Lee, VA  
**Client:** United States Army ALMC  
**Performance:** 1992

**Project:** Furnish, install, and test three television studios. Work included providing material, engineering and installation services for the installation of one and the relocation of two color television production studios. Equipment included production switcher/router, cameras, VTRs, graphics generators, digital frame store, sync generator, distribution amplifiers, patch panels and video and waveform monitors and audio monitors. Installation task included matching cable lengths so that timing and video arrived at switcher in synchronization so that multiple images could be merged and over-laid without distortion. Required testing included proof of performance of total system.

## CONTRACT REFERENCES

### 13. Ku-Band Video B-MAC Uplink Earth Station 1191

**Service Type:** Turnkey System Implementation  
**Location:** U.S. Postal Service Headquarters, Washington, DC.  
**Client:** United States Postal Service  
**Performance:** 1992

**Project:** Engineer, furnish, install, and test, a Ku-Band video terminal consisting of; a 4.57 meter Ku-band antenna with redundant TWT HPAs, LNA, Video Exciters, a Level 1 Redundant B-MAC terminal, B-MAC video receivers and Earth Station Controller subsystem. System provided video conferencing and video broadcast capabilities. Remote monitor and control software developed by ASTRO.

### 12. Ku-Band Earth Station Maintenance and Survey 1105

**Service Type:** System Maintenance  
**Location:** VOA European Maintenance Group 1  
**Client:** United States Information Agency  
**Performance:** 1988 - 1993

**Project:** Provide maintenance and logistic support for existing Ku-Band TVRO terminals throughout Europe region. Total of 52 sites are maintained on an annual basis. Systems range from 1.8 meter to 7.0 meter diameter antennas with multiple receivers which form part of an interactive teleconferencing network. Also furnish site surveys to determine viable locations for new TVRO sites.

### 11. Digital 18 GHz 4-DS1 Digital Radio System 1290

**Service Type:** Turnkey System Implementation  
**Location:** Silver Spring/Suitland  
**Client:** C&P Telephone/NOAA-NWS  
**Performance:** 1990

**Project:** Engineer, install & test a duplex, single channel, 4 DS-1 digital data link between the NWS Silver Spring facility and Federal Office Building 4 (FOB-4), Suitland, Maryland. All equipment provided by the client. Project included the design of two (2) antenna mounts and tower inspection/report.

### 10. Ku-Band Earth Station Terminal 1004

**Service Type:** Turnkey System Implementation  
**Location:** U.S. Naval Observatory, Washington, DC  
**Client:** United States Navy  
**Performance:** 1987

**Project:** Furnish a 1.8 meter Ku-band antenna with HPA, LNA, Up Converter, and Down Converter. Additional equipment includes deicing and controls for the antenna.

## CONTRACT REFERENCES

### 9. Video Service Microwave System 1120

**Service Type:** Turnkey System Implementation  
**Location:** College Park, Maryland  
**Client:** University of Maryland  
**Performance:** 1991

**Project:** Engineer, furnish, install & test a simplex, dual channel, 23 GHz video link to interface the University of Maryland, University College Instructional Television channels with a local cable TV distribution system.

### 8. Digital Microwave Communication System 1095

**Service Type:** Turnkey System Implementation  
**Location:** Kodiak, Alaska  
**Client:** United States Coast Guard  
**Performance:** 1991

**Project:** Engineer, furnish, install and test an 8 GHz Digital Microwave Communication System with Terrestrial Loop Protection for T1 circuits, at the U.S. Coast Guard Communication Station located at Kodiak, Alaska.

### 7. Analog Microwave Communications System 1111

**Service Type:** Turnkey System Implementation  
**Location:** Puerto Rico, U.S. Virgin Islands  
**Client:** United States Coast Guard  
**Performance:** 1991 - 1993

**Project:** Engineer, furnish, install, test, and maintain a 1.8 GHz Microwave Communication System in the Caribbean Region.

### 6. International Receive Earth Station System 1034

**Service Type:** Engineering Study  
**Location:** Washington, DC  
**Client:** Commercial  
**Performance:** 1987

**Project:** System design and preparation of complete technical specifications for a multiple-frequency band Communication Satellite Earth Station. Project included the preparation of technical specifications for multi-frequency earth station antenna subsystems: feed, servo subsystems, multi-frequency LNAs, down converters, receivers, and signal processing equipment. Included was a complete video teleconference system consisting of twenty terminals at geographically dispersed locations. In addition, specifications for station facilities including building, power generation, fuel storage, and security requirements.

## CONTRACT REFERENCES

### 5. Domestic TVRO/Low Power TV System 1024

**Service Type:** Engineering Study/Beta Test Site  
**Location:** Washington, DC - Beeville, TX  
**Client:** ABN, Inc. (Impact Capital Partners Ltd.)  
**Performance:** 1987

**Project:** System design and preparation of technical specifications for Low Power TV Transmitters and C-Band TVRO terminals. Project included performance of a marketing and feasibility study related to the Low Power TV industry.

### 4. Computer-Controlled Energy Management System 1085

**Service Type:** Turnkey System Implementation  
**Location:** Seymour Johnson AFB, NC  
**Client:** United States Air Force  
**Performance:** 1990

**Project:** Engineer, furnish, install and test a two-way, half duplex RF data transmission for communications between an energy monitoring and control system (EMCS) and an existing site radio switch.

### 3. Mobile & Fixed Video Transmission System 1050

**Service Type:** Turnkey System Implementation  
**Location:** Vandenberg AFB, CA  
**Client:** United States Air Force  
**Performance:** Sep 89 – Jul 91

**Project:** Engineer, furnish, install & test a fixed/mobile 15 GHz video/audio Microwave System with VTC to provide real-time television presentation of launch vehicles during pre-launch and early flight stage. Project includes the design, installation, and testing of two (2) mobile video equipment vans.

### 2. Electronic Telephone Switch 1082

**Service Type:** Turnkey System Implementation  
**Location:** Aberdeen Proving Ground, MD  
**Client:** United States Army  
**Performance:** 1990

**Project:** Engineer, furnish, install & test, electronic Digital Telephone Switch System at the Wheeled Vehicle Facility, and engineer, furnish and install Instrumentation Cable and Telephone System at the Aircraft Vulnerability Test Facility.

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### 1. 1 kW Dual Transmitter, Remote Controlled Broadcast Facility 1045

**Service Type:** Turnkey System Implementation  
**Location:** Adak, Alaska  
**Client:** United States Navy  
**Performance:** Oct 89 – Nov 90

**Project:** Engineer, furnish, install and test a dual, 1 kW AM Transmitter facility for the United States Navy, Naval Broadcasting System at Adak, Alaska. Project included the design of an equipment shelter, a 120 foot, guy supported antenna, and associated civil works. Upon completion of installation activities, engineering personnel performed system tests and site commissioning.