

Firefinder System Plan  
Performance Plan and Agreement  
June 9, 2003

The purpose of this document is to create a Performance Plan and Agreement (PPA) among Forces Command (FORSCOM), U.S. Training and Doctrine Command (TRADOC), Project Manager (PM) Firefinder, U.S. Army Materiel Command (AMC), and Headquarters Department of the Army (HQDA) regarding the Recapitalization (RECAP) effort of the AN/TPQ-36 version (V8) eight Firefinder Antenna Transceiver Group (ATG). This PPA provides baselines and targets for tracking the performance benefits of the Firefinder AN/TPQ-36 (V8) ATG RECAP program.

Background: The AN/TPQ-36 (V8) Firefinder radar is a highly mobile weapon locating radar designed for automatic first-round location of weapons firing projectile type rounds (mortars, artillery, and rockets). While tracking its target, the radar continues to scan, locate, and process tracks on other targets. The radar also tracks fire from friendly weapons. The AN/TPQ-36 (V8) radar set consists of two major units powered by a Mobile Electric Power (MEP) 112A generator, the Operations Control Group (OCG) also referred to as the shelter unit and the ATG. The shelter contains two operator stations, a processor unit, a map display unit, and a communications interface. The ATG trailer contains the Exciter, Transmitter, Receiver, Low-noise Amplifier, and Antenna units.

In the early 1990s, the ATG units underwent a limited overhaul program, which consisted of inspection, testing, repair and replace Line Replaceable Units (LRUs) as necessary. This overhaul program did not address any technology insertion or parts obsolescence. Under the RECAP program, selected components/assemblies will be inserted into the ATG for purposes of upgrading the current configuration, improve reliability, maintainability, and extend system life expectancy.

In Fiscal Year (FY) 2002, the AN/TPQ-36 (V8) ATG RECAP program was initiated as a joint effort through a partnership between Raytheon Systems Company, the Original Equipment Manufacturer (OEM), and Tobyhanna Army Depot (TYAD). Raytheon Systems Company is leading the program by recapping the first system antenna at their facility in Indianapolis and the remaining two antennas are being recapped by TYAD. There are currently 92 AN/TPQ-36 (V8) Firefinder systems in the active United States Army and National Guard. There are 45 systems that have been approved for RECAP. A decision is required in FY06 on whether to complete the remaining 47 systems.

### Program Description:

The goal for Firefinder RECAP is to incorporate the latest configuration of the AN/TPQ-36 (V8) ATG into "zero hours/zero miles systems". The planned RECAP approach is to implement technology insertion leveraged off the Sentinel Air Defense Radar Antenna program to replace Firefinder obsolete components and LRUs that have lower than expected Mean Time Between Failures (MTBF). Raytheon also being the Sentinel OEM has intimate knowledge and expertise on the commonality of the two radars.

To begin implementing the RECAP program, an initial survey will be performed on each radar to determine the condition of various parts and a mandatory parts replacement list will be generated. Technology insertion leveraged off the Sentinel Air Defense Radar Antenna and mandatory replacement parts will be used to improve reliability and address parts obsolescence. Both lists will be updated quarterly as lessons are learned and the RECAP process is further implemented. These lists will be revised as necessary to incorporate the latest analysis of candidate components to ensure RECAP resources are focused on the highest payoff components. Electromechanical components with limited life expectancy, unprocurable components and components with low MTBF will be screened and replaced. Gaskets, seals, filters, cables, and wiring harnesses will be replaced. The Antenna Trailer will be replaced as part of the AN/TPQ-36 (V8) Europe upgrade. Final acceptance and live fire tests will be performed for compliance with system specifications and to minimize infant mortality.

Raytheon Systems Company will use technology insertion to solve parts obsolescence problems, perform all testing required to prove out the technology insertion and configuration changes, and provide all necessary documentation to TYAD. In addition, Raytheon will assist TYAD with recap implementation of their first two systems. The TYAD will develop National Maintenance Work Requirements to support the newly recapped systems.

### Initiative Description:

Recapitalize the AN/TPQ-36 (V8) Firefinder ATG by:

- a. Inserting new technology, via integration of Sentinel parts to address parts obsolescence issues ensure operational readiness, and increase reliability and maintainability.

b. Restoring each selected system to a Class A condition in appearance, performance and life expectancy. Equipment that is not replaced will be refurbished.

c. Screening and replacing electromechanical components with limited life expectancy.

d. Replacing all gaskets, filters, seals, cables, and wiring.

e. Removing, testing, and repairing LRUs to a National Maintenance Standard.

f. Replacing all parts identified on the RECAP mandatory replacement parts list. This list will be a living document and will be revised as lessons are learned.

g. Performing live fire testing on completed recapped systems at Yuma Proving Ground prior to fielding.

The AN/TPQ-36(V8) ATG will be fielded with the upgraded shelter, that is currently being fielded by PM Firefinder under an approved materiel change program. New Tactical Quiet Generators (TQG) will be supplied by PM Mobile Electric Power(MEP). The upgraded shelter replaces the electronics contained in the original shelter or OCG providing enhancements to reliability, maintainability, survivability, and system ergonomics. The new TQGs MEP 813A offers the following improvements in comparison to the old generators M11282:

a. Lighter in weight and cube.

b. Increase reliability with an MTBF of 462 hours as compared to 250 MTBF hours for the older MEP 11282.

c. Easier to operate and maintain.

d. Reduced infrared signature to make it harder to detect.  
Reduced noise level.

This fielding approach will provide a total system to the soldier that is "zero hours/zero miles" standard with increased operational readiness, reliability, maintainability, and extended system life.

#### Method of Performance Measurement for Recapped ATG.

The basic objectives of the RECAP program include: Extend service life, reduce operating and support costs, improve random access memory, and enhance capability as applicable. Therefore, performance based measurements are required to track program success and will form the basis for performance tracking and assessment. These measurements will allow the United States Army to gauge benefits of the Firefinder RECAP program.

Business Process Improvement Directorate (BPI) in coordination with PM Firefinder will track the Firefinder system using a Sample Data Collection/Field Exercise Data Collection (SDC/FEDC) Program, currently being tailored for recapitalization programs, by the U.S. Army Materiel Systems Analysis Activity (AMSAA).

The PM Firefinder will track specific metrics outlined in the RECAP Program Baseline (RPB) to measure the overall effectiveness of the Firefinder Focused RECAP Program. Additional performance metrics, identified in Table 1a, will be tracked for further program assessment.

AMSAA, BPI, and PM Firefinder will partner and work as a team to implement the use of Automated Identification Technology (AIT) on the recapped ATGs. Contact Memory Buttons, 32 kilos, will be installed on the six Sentinel recapped parts (see Table 1b) and the newly recapped ATG for data collection and assessment.

Sample sets will be established as a basis to collect performance measurements in support of performance metrics for legacy and newly recapped systems. The first sample set will be composed of legacy components related to these recapped parts and components. Beginning FY03, AMSAA will initiate data collection on this sample set to quantify historical data on these legacy systems and to establish a realistic baseline comparison. The second sample set will consist of fielded recapped systems, which will be tracked through use of AIT. Data collected will be used to perform comparative analysis and provide adjustment information to establish an accurate baseline for the recapped components and ATG.

For each sample set, data elements identified in Table 1a will be tracked and used as performance metrics to better achieve an accurate assessment of the total ownership cost for fielded recapped systems:  
Table 1a–Metrics identified for AMSAA Data Collection.

ATG Operating Hours	Filament Operating Hours	High Voltage Operating Hours	Failures (All types)	Maintenance Man-Hours	Repair and/or Replacement Cost
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These measurements will allow the Army to track program success, assess the benefits of RECAP, and demonstrate its performance impact on the fleet versus non-recapped systems.

**System Specific Data Collection:**

Data elements identified in TABLE 1a above will be collected by serial number on all RECAP items in Table 1b. These data elements will be tracked and used for analysis/evaluation and performance measurements under AMSAA's SDC/FEDC efforts.

**Table 1b—Listing of Firefinder Legacy Components with corresponding Replacement RECAP National Stock Number (NSN) and part number (P/N).**

Description	Legacy NSN/Part number	Replacement Recap NSN/Part number	RECAP Baseline MTBF (Hours) *
Frequency Multiplicr	5840-01-088-6654 P/N: SM-D-803209	5895-01-496-3911 P/N: 5187219	7,973
A Oscillator	5840-01-088-6656 P/N: SM-D-803216	5955-01-496-3916 P/N: 5187220	15,946
B Oscillator	5840-01-238-9511 P/N: C5000821	5955-01-496-3909 P/N: 5187221	15,633
Cathode Regulator Assembly	5895-01-092-7776 P/N: SM-D-803284	6110-01-496-4264 P/N: 5187222	34,667
Pulse Amplifier CCA	5840-01-224-8134 P/N: SM-D-803293	5998-01-496-3908 P/N: 5187218	14,132
RF Converter Assembly/Single Module Receiver	5895-01-088-6678 P/N: SM-D-803203	5895-01-496-3910 P/N: 5187207	7,816

ATG by Serial Number	5840-01-084-5293 P/N: C5000601 Or 1430-01-383-7172 P/N: A3184257 Or 5840-01-086-4728 P/N: A3203904	TBD	788
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\*RECAP Baseline MTBF hours are estimated and will be adjusted as more data become available.

All signatories agree to the following:

- a. This is a living document and is current as of January 9, 2003.
- b. The Methods of Performance Measurements as outlined above.
- c. HQDA BPI in coordination with all parties will track results of Firefinder RECAP performance metrics established in this agreement.
- d. The HQDA BPI in coordination with all parties, will supply tracking results to participating organizations via the Acquisition Information Management website and tailored reports.
- e. The HQDA BPI will report tracking results to Army Senior Staff.
- f. The PM Firefinder in coordination with all parties will assist with metric development to be used in tracking execution.
- g. The PM Firefinder in coordination with signatories (dependent upon who is funding the effort) will supply Field Service Representative report data to HQDA BPI.
- h. The warfighters will ensure continued emphasis on accurate data reporting.
- i. The warfighters will facilitate/authorize HQDA liaison visits when necessary.
- j. Component/sub-component serial numbers will be linked prior to fielding.

k. The PM Firefinder/AMC will provide updates to induction/distribution schedules, performance standards, and baselines when ever necessary to HQDA BPI.

l. The HQDA will furnish funding details as requested, but at least monthly.

m. Deputy Assistant Secretary of the Army for (Cost and Economics) (DASA (CE)) will perform substantive review of Major Army Command validated economic analysis for recapitalization and perform independent validation when applicable.

AGREEMENT DATE: June 9, 2003

APPROVED BY:

PM, Firefinder LTC J. Masterson/s-January 16, 2003

PM, Night Vision COL M. Bowman/s-February 11, 2003  
Reconnaissance, Surveillance  
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PEO, IEW & S Mr. Edward T. Bair/s-April 11, 2003

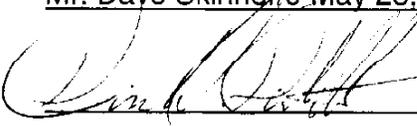
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Firefinder Weapon CW4 J. T. Edward/s-January 17, 2003  
System Integrator, HQDA

AMC COL Moses Whitehurst/s-April 30, 2003

DASA Mr. John Murray/s-June 5, 2003  
(Cost and Economics)

FORSCOM Mr. Daye Skinner/s-May 28, 2003

ASA(ALT)  14 JUL 2003