HISTORICAL AERIAL PHOTOGRAPHY, 1937 FARM SERVICE AGENCY AAJ/AAK PROJECT,

DAVIS, WEBER, AND BOX ELDER COUNTIES, UTAH

by Steve D. Bowman, Keith Beisner, and Corey Unger

OPEN-FILE REPORT 540
UTAH GEOLOGICAL SURVEY
a division of
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INTRODUCTION

This compilation of the 1937 Farm Service Agency (formerly the Agricultural Adjustment Administration) AAJ/AAK Project includes 261 scanned aerial photograph prints (frames) of Weber, Davis, and Box Elder Counties, Utah. These frames were taken as part of the Agricultural Adjustment Administration's (AAA) national programs in conservation, land-use planning, and ensuring compliance with farm output (Monmonier, 2002).

This compilation covers the area from Willard, Utah, south to Farmington, Utah, and between the Wasatch Range front and Great Salt Lake. These aerial photographs will be useful for professionals involved with geologic, geotechnical, and environmental assessment and investigation projects; land-use planning; governmental agencies; and the general public and others as an historical archive.

The aerial photography project generally utilized AAA standards as described in table 1 and was part of a larger 1937 project to acquire approximately 94,045 square miles of aerial photography in the western region of the AAA (Tubis, 1937).

Table 1. General Agricultural Adjustment Administration Aerial Photography Specifications (Tubis, 1937).

Scale	1:20,000
Print Overlap	65% average
Strip Overlap	30% average
Flight Direction	North-South
Tilt	Maximum 1° average for project
Crabbing	10% maximum
Scale Accuracy	Within 5%

SCANNING AND INDEXING

Each grayscale aerial photograph frame print was scanned on an Epson 1640XL scanner, utilizing an 8-bit grayscale color space at a resolution of 600 dots per inch (dpi) (42 microns) with unsharp mask enhancement. The resultant image scans were saved in the Tagged Image File Format (TIFF) with no compression. Each image TIFF file was sharpened once using Paint Shop Pro (PSP) version 8 to reduce printing and scanning artifacts. Frames 2-16, 3-15, 3-16, 3-17, 3-30, 3-31, 3-44, 3-45, 3-46, and 3-58 were missing in our collection and were scanned by Double Delta Industries, Inc. of Woodbine, Maryland, from the original film collection at the National Archives, Cartographic and Architectural Section, in College Park, Maryland. These frames were scanned on a Microtek 1000XL scanner, using an 8-bit grayscale color space at a resolution of 600 dpi (42 microns).

Four photo index maps (non-orthorectified) were scanned on a Contex Chroma HS 42 scanner, using an 8-bit grayscale color space at a resolution of 600 dpi (42 microns). The resultant image scans were saved in TIFF format with LZW compression and in Adobe PDF format. Some image restoration and enhancement was performed on each photo index scan image. The scanned photo index maps may be located on the \AutoPlay\Docs\Index directory of the first DVD.

As a line or point index map is not available for the 1937 AAJ/AAK aerial photographs, the center point of each image scan was determined using a grid in Adobe Photoshop CS. This center point location was then compared to modern Google Earth imagery to determine approximate coordinates in the simple cylindrical (Plate Carree or latitude/longitude) projection, WGS84 datum. These center point coordinates were then used to create index maps as a Google Earth KMZ file and as an Environmental Systems Research Institute (ESRI) shapefile (SHP) for use in GIS software.

DIGITAL FILES

A compressed keyhole markup language (KMZ) file was developed in Google Earth version 4.3 with photograph center points indicated as placemarks. Each placemark contains an embedded thumbnail (reduced resolution) image of the corresponding image

frame for reference and ease in locating aerial photograph frames. The latest version of Google Earth may be downloaded from: http://earth.google.com.

To view the photograph center point placemarks easily, we recommend turning off unneeded layers in Google Earth by unchecking selection boxes next to the Gallery, Traffic, Weather, and Places of Interest layers in the Layers pane. Other layers may also be turned off; however, at a minimum, the Roads, Borders and Labels, and Terrain layers should be checked (turned on) for an adequate base map to be visible. The Layers pane is along the left side of the Google Earth window, below the Search and Places panes. Thumbnail images of the frames may be viewed by clicking once on either the red bulls-eye placemark symbol on the map or on the frame number in the Places frame. Double clicking on the frame number in the Places pane will zoom to the selected frame center point location.

A shapefile was developed in ESRI ArcGIS 9.3 software, utilizing the point geometry type and the Universal Transverse Mercator (UTM), Zone 12 North, NAD83 coordinate system. This shapefile contains an attribute table with frame information where known, including approximate frame center point coordinates, scan filename, flight line number, frame number, film type, exposure (acquisition) date and time, image scale, scanner model, and scan resolution. Additional information, such as camera and film specifications, is not available. The shapefile may be located on the \AutoPlay\Docs\Shapefiles directory of the first DVD disk.

For users without ArcGIS or other GIS software, the shapefile may be viewed using ESRI's ArcExplorer software available from: http://www.esri.com/software/arcgis/explorer/index.html.

A complete index map is included on the first DVD as plate 1 in Adobe PDF format. The base map for plate 1 utilizes U.S. Department of Agriculture (USDA) 2006 National Agriculture Imagery Program (NAIP) statewide orthophotography for easy reference to current cultural features.

PDF files may be viewed using the free Adobe Reader software. The latest version of the software may be downloaded from: http://www.adobe.com/products/acrobat/readstep2.html. We recommend that Adobe Reader version 9 or later should be used to view the index map for enabling geospatial features.

Once individual frames are identified from the indexes, the corresponding high-resolution TIFF files may be located on the \AutoPlay\Docs\Images directory of the two DVDs.

LIMITATIONS

Due to the age of the aerial photograph prints, several of the prints contain various markings from previous use. These markings may include alignment marks and lines, named geographic features, fault traces, and other features. None of these markings have been verified for accuracy in location and/or classification. As a result, these markings should not be relied upon for any purpose.

Since the aerial photograph frame-center points are estimated, some undetermined positional error exists between the frame center points and the actual ground locations.

Several of the frames covering the Hill Air Force Base area indicate the text *Restricted* in the upper-right corner of the frame near the frame number information. At the time of the frame acquisition, they were restricted in disclosure; however, they are no longer restricted and are available to the general public. Due to limited staff at the National Archives, not all of the frames affected have been updated by strikeout text or other means of updating the classification (Jerald Luchansky, National Archives, verbal communication, October 6, 2008).

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