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ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

SUBJECT: EXPERIMENTAL PROFILE DESCENT PROCEDURES/CHARTS

TPD-494, 4

1. PURPOSE. This Advisory Circular provides the aviation community with advance information on experimental PROFILE DESCENT procedures and charts that will be published for use at Stapleton International Airport, Denver, Colorado, on December 2, 1976.
2. RELATED DOCUMENTS.
 - a. Air Traffic Control Handbook, 7110.65.
 - b. Standard Terminal Arrival Routes (STARs) publication effective November 4, 1976.
 - c. Experimental PROFILE DESCENT procedures for Stapleton International Airport, Denver, Colorado, effective December 2, 1976.
3. DISCUSSION.
 - a. The Federal Aviation Administration (FAA) has completed an evaluation of existing programs which were designed to minimize the amount of time high performance aircraft (turbojet aircraft and turboprop aircraft weighing more than 12,500 pounds) operate in and around terminal areas. These programs have as goals: (1) increased safety by reducing exposure time between controlled and uncontrolled aircraft at lower altitudes around airports, and (2) reduce aircraft noise in the proximity of airports.
 - b. A third and fourth goal were added - conservation of aviation fuel and standardization of ATC arrival procedures.

- c. In pursuit of these new goals, PROFILE DESCENT procedures were designed and subsequently evaluated at several locations such as Chicago O'Hare, Dallas-Ft. Worth and Kansas City Airports. A PROFILE DESCENT is a near-optimum descent from cruising altitude/level to interception of a glide slope or to a minimum altitude specified for the initial or intermediate approach segment of a non-precision instrument approach and terminates at the approach gate where the glide slope or other appropriate minimum altitude is intercepted.
- d. The evaluation of PROFILE DESCENT procedures revealed that significant fuel savings could be realized. However, the opportunities to use the PROFILE DESCENT procedures diminished when control of air traffic was complicated by: (1) the various aircraft operators descending at different speeds; (2) operators had varying conceptions of the procedure; and (3) controllers were not thoroughly familiar with the procedure.
- e. Users' and controllers' comments indicated that a published PROFILE DESCENT procedure (similar to a STAR or IAP) could somewhat standardize descent speeds and provide mutual understanding of the procedure - thus increasing the potential usage and benefits derived from PROFILE DESCENT procedures charts. The procedures contained in this Advisory Circular are a result of that evaluation and comments received.
- f. The initial PROFILE DESCENT procedures charts will be published only for Stapleton International Airport, Denver, Colorado, and are designed to be used in conjunction with the corresponding STAR. The depiction of these procedures is a new concept and is subject to change as comments are received and need dictates. Future PROFILE DESCENT procedures may be included as an integral part of a STAR in the STAR publication beginning February 24, 1977.

4. PROCEDURES.

- a. A PROFILE DESCENT CLEARANCE constitutes an ATC clearance and separation from other IFR air traffic is based upon pilot compliance with the PROFILE DESCENT procedures as depicted on the graphic (See Appendix 1). PROFILE DESCENT clearances are subject to traffic conditions and may be altered by ATC, as necessary. An ATC clearance must be received in order to execute a PROFILE DESCENT. Acceptance, by the pilot, of a PROFILE DESCENT clearance requires the the pilot to adhere to altitudes, speeds and headings as

depicted on the PROFILE DESCENT chart. Any subsequent clearance received such as a new assigned altitude, voids all altitudes depicted on the PROFILE DESCENT chart, but the pilot must continue to adhere to the speeds and headings as depicted. Similarly, any clearance which changes a speed restriction or depicted vector heading would not affect the depicted altitude. Pilots will be cleared initially to fly a specified STAR and advised which RUNWAY PROFILE DESCENT to expect.

Example: "Cleared for a KEANN ONE ARRIVAL expect

KEANN RUNWAY 26 PROFILE DESCENT."

Prior to the time of transitioning from the STAR to the PROFILE DESCENT, ATC (normally the ARTCC) will clear the aircraft for a specified RUNWAY PROFILE DESCENT.

Example: "Cleared for KEANN RUNWAY 26 PROFILE

DESCENT. Cross KEANN at 17,000 feet."

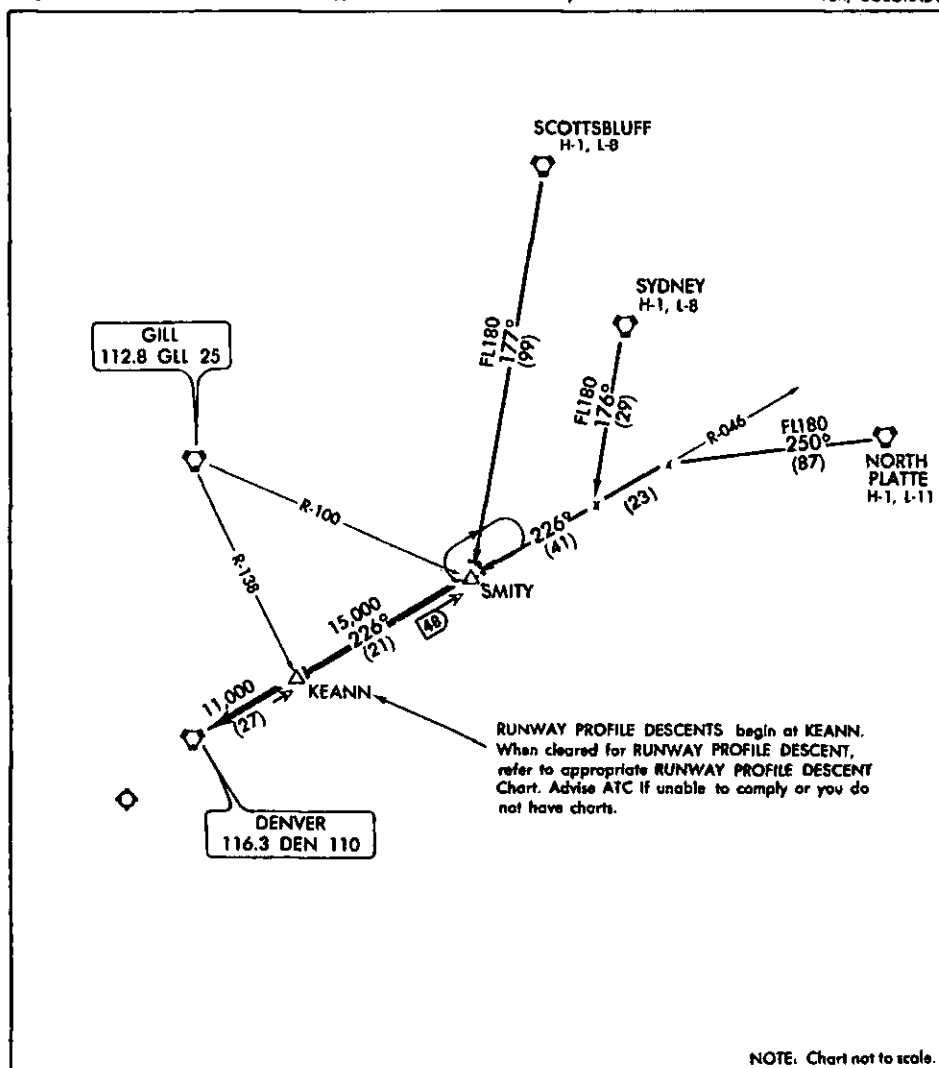
- b. Speed adjustments should be performed immediately prior to the fix where the specified or depicted speed is required. Normally, this would be 7 to 10NM from the fix. Random speed reductions by pilots may cause compression between aircraft which could result in the use of speeds below 210 knots, excessive vectoring and/or holding at low altitudes in order to resequence aircraft at the required interval.
 - c. THE PROFILE DESCENT CLEARANCE DOES NOT CONSTITUTE CLEARANCE TO FLY AN INSTRUMENT APPROACH PROCEDURE (IAP). The last "Maintain altitude" specified in the PROFILE DESCENT procedures chart constitutes the "last ATC assigned altitude" and the pilot should maintain such altitude until he is cleared to another altitude or cleared for an approach and he is established on a published route segment of the IAP.
5. MISCELLANEOUS. The PROFILE DESCENT procedures published for Stapleton International Airport, Denver, Colorado, are current as of the date of publication, December 2, 1976, and will not be subject to change until the next scheduled revision of the STAR booklet, effective February 24, 1977.

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FIGURE 1. EXAMPLE

KEANN ONE ARRIVAL (SMITY.KEANN1)

STAPLETON INTL
DENVER, COLORADO

NORTH PLATTE TRANSITION (LBF.KEANN1): From over NORTH PLATTE VORTAC via NORTH PLATTE R-250 and DEN R-046 to SMITY INT. Thence

SIDNEY TRANSITION (SNY.KEANN1): From over SIDNEY VORTAC via SIDNEY R-176 and DEN R-046 to SMITY INT. Thence

SCOTTSLUFF TRANSITION (BFF.KEANN1): From over SCOTTSLUFF VORTAC via SCOTTSLUFF R-177 to SMITY INT. Thence

. . . . From over SMITY INT via the DEN R-046 to DEN VORTAC.

KEANN ONE ARRIVAL (SMITY.KEANN1)

DENVER, COLORADO
STAPLETON INTL

FIGURE 2. EXAMPLE

Chart not to scale

RADAR REQUIRED

GILL
112.8 GLL 25

DENVER
116.3 DEN 110

R-167

R-138

R-100

R-046

15,000

SMITY

226°

KEANN

11,000

BURTY

11,000

Cross at 17,000 at 250K

Cross at or above 12,000
Descend and maintain 8000
Turn left to 170°, Reduce to 210K
Expect vector to final approach course

LOST COMMUNICATIONS: Proceed via
BURTY thence direct DENVER VORTAC,
maintain 11,000

DESCENT FROM KEANN TO RUNWAY 26 APPROXIMATELY 300' PER MILE AND 41 FLYING MILES.

Chart not to scale

RADAR and DME REQUIRED

GILL
112.8 GLL 25

DENVER
116.3 DEN 110

LOST COMMUNICATIONS:
Proceed direct DENVER
VORTAC, maintain 11,000

KEANN

Cross at 13,000
Turn left to 170°, Reduce to 210K
Expect vector to final approach
course

Cross at 11,000
Descend and maintain 9000

Cross at FL 220 at 250K

SMITY

0468
226°

15,000

27

R-046
11,000

R-130

R-100

48

DESCENT FROM KEANN TO RUNWAY 35 APPROXIMATELY 300' PER MILE AND 56 FLYING MILES.

KEANN - RUNWAY 35 PROFILE DESCENT