

**DYNAMIC CHANNEL ALLOCATION  
FEATURE DOCUMENT  
1A ESS™ SWITCH  
AUTOPLEX™ SYSTEM 100  
CELLULAR TELECOMMUNICATIONS SYSTEM**

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CELL . . . . .	2	1.01 A DCA (Dynamic Channel Allocation) feature increases the effective use of the spectrum by allowing voice radio channels that interfere with one another to be equipped at multiple cell sites. The availability of such a channel for a mobile call at one cell is conditional with the channel not being in use at an interfering cell.	
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## BACKGROUND

**1.02** At the MTSO (mobile telephone switching office), a voice radio channel is associated with a cell site voice trunk. The cell site voice trunk is identified by its TNN (trunk network number). The channel selection process uses the cell and the antenna face to determine a RI (route index) from which a TG (trunk group) is obtained. The TG is then accessed for an idle member which is identified by a TNN. A list of interfering TNNs is associated with a TNN using DCA. The selected TNN is used only if all interfering TNNs are idle.

## AVAILABILITY

**1.03** The DCA feature is available with the 1AE9.05 and later generic programs.

## FEATURE GROUPS

**1.04** The DCA feature is an optional custom feature and is available in the AMPSCP (System 100 call processing) feature package.

## FEATURE ASSIGNMENT

**1.05** The DCA feature is assigned on a per MTSO basis.

## 2. USER PERSPECTIVE

### FEATURE DESCRIPTION

**2.01** The assignment of a DCA to a voice radio channel is through its TNN to TGN auxiliary block. The TNN to TGN auxiliary block includes a DCA indicator and TNNs of the interfering voice radio channels. When a cell site trunk (voice radio channel) is selected that uses DCA, the PMT (path memory for trunk) state of each interfering TNN is examined. If any interfering voice channel is in use, the selected voice radio channel is idled and another channel is selected. This process can be repeated up to eight times before the selection routine indicates that no cell site trunks are available.

**2.02** Dynamic channel allocation can be used with 1-way or 2-way trunks. If 1-way trunks are selected, they are chosen on a "longest idle" basis. There is no preference for selecting DCA versus non-DCA trunks in a 1-way trunk group.

**2.03** If 2-way trunks are selected, the algorithm returns the lowest number idle member. If the 2-way trunk group is arranged with both non-DCA low members and DCA high members, a preference to non-DCA exists. Two-way trunk groups allow nonadjoining members. Therefore, a "gap" may exist between non-DCA and DCA members to permit growth of DCA and non-DCA subgroups independently.

## INTERACTION

**2.04** Interfering cell sites are limited to those served by a single AUTOPLEX System 100 MTSO. Cellular networking is not affected by the DCA feature.

## 3. ENGINEERING

### CELL

**3.01** It is not intended for DCA to replace standard cell engineering methods. Neither is it expected that complex dependencies between many cells will be established by DCA. Rather, DCA should be used to overcome the few instances where interference exists when standard cell engineering methods are applied. It may also be useful for areas that have shifting load peaks (e.g., morning commuter traffic moving into a city). In any event, the number of DCA trunks in a trunk group and the number of interfering TNNs per channel should be minimized. The system call capacity should be monitored to assure that it is not degraded.

### SOFTWARE

#### A. Base Generic Program

**3.02** Dynamic channel allocation adds approximately 1000 words to the generic program.

#### B. Parameter/Call Store Areas

**3.03** Two 2-word call store parameter blocks, QG2DCACOLL and QG2DCAHOLD, provide the address and size of arrays to collect and hold DCA traffic counts. Each array contains two words per cell. The first word contains the count of successful DCA channel selections. The second word contains the count of failed selection attempts due to DCA conflict.

**C. Translations**

**3.04** The TNN-TGN for *auxiliary block cell site trunks* is modified to include a list of other TNNs that identify interfering channels. (See Fig. 1.)

(a) **Word 1:** The DCA (Bit 23) indicator is set to 1 when this TNN represents a voice radio channel that uses DCA.

(b) **Words 3 through N, Type B:** Bits 22 through 19 when set to 0101 indicate that the word contains the TNN (Bits 14 through 0) of an interfering voice radio channel.

For additional information regarding the TNN-TGN auxiliary block for cell site trunks, refer to Part 6 B(5).

**3.05** For example, consider cells A, B, and C where channel 1 interferes on cells A and B and channel 2 interferes on cells B and C.

- The TNN for cell B channel 1 is included as an interfering TNN in the TNN-TGN auxiliary block for cell A channel 1 TNN.
- The TNN for cell A channel 1 is included as an interfering TNN in the TNN-TGN auxiliary block for cell B channel 1 TNN.
- The TNN for cell C channel 2 is included as an interfering TNN in the TNN-TGN auxiliary block for cell B channel 2 TNN.
- The TNN for cell B channel 2 is included as an interfering TNN in the TNN-TGN auxiliary block for cell C channel 2 TNN.

	23.	22.	21.	20.	19.	18.	17.	16.	15.	14.	13.	12.	11.	10.	9.	8.	7.	6.	5.	4.	3.	2.	1.	0.
<b>WORD 0</b>	0	WRDN				0 0 0 0 0 0 0 0 0 0								MEMN (2-WAY) OR ALL ZEROS										
<b>WORD 1</b>	*	0	0	0	0	TCC								TGN										
<b>WORD 2 TYPE A</b>	0	WRDFN=0			0	0	FRAME	FG	VR			CHN												
<b>WORD 2 TYPE B</b>	0	WRDFN=0			0	0	VRG			VR			CHN											
<b>WORD 3 THRU N TYPE A</b>	0	WRDFN			AKMN								UTYMN											
<b>WORD 3 THRU N TYPE B</b>	0	WRDFN			0	0	0	0	TNN															

N<30

Note 1: Words 3 through N can either indicate carrier group alarm, trunk make-busy, or trunk network number and is repeated as necessary. All unused words are built all zeros.

Note 2: Required location LUCS (lower unduplicated call store).

\* Dynamic Channel Allocation

**Fig. 1—Network Number to Trunk Group Number for Auxiliary Block Cell Site Trunks**

#### 4. IMPLEMENTATION

##### SET CARDS

**4.01** Set card FF035 is assigned to the DCA custom feature. Set card calculation is as follows:

- If FF035 equals 1, the DCA custom feature is turned on.
- If FF035 equals 0, the DCA custom feature is not turned on.

##### RECENT CHANGE MESSAGE

**4.02** A new recent change message, RC:DCHA, is applicable to the DCA feature. This message builds information for the DCA capability using keyword DCATNN (dynamic channel allocation trunk network number) and either ATNN (add trunk network number) or DTNN (delete trunk network number). Refer to Part 6 for detailed RC procedures.

##### VERIFICATION

**4.03** Comprehensive information concerning TTY input and output messages are found in Part 6.

**4.04** The VF:TNN SVY input message is modified to allow the newly defined keyword DCATNN to survey for those TNNs that have DCA feature capabilities.

**4.05** The TR14 output message is modified to indicate if the specified TNN uses DCA.

*Note:* The TR14 output message currently provides the TNN-TGN auxiliary block address. This can be dumped to identify interfering TNNs.

#### 5. ADMINISTRATION

##### MEASUREMENTS

**5.01** New per-cell peg counts are required to show usage and blockage for DCA. These counts will be added to existing cell data on the AMPSTRAF (System 100 Traffic) printouts. No new EGOs are required. Refer to Part 6 for detailed traffic information.

#### 6. SUPPLEMENTARY INFORMATION

##### REFERENCES

**6.01** The following documentation contains information related to or affected by the DCA feature.

##### A. AT&T Practices

- (1) 231-200-005 Mobile Telephone Switching Office, Cell Site, and Subscriber Unit System Description—AUTOPLEX System 100
- (2) 231-218-301 Recent Change Formats and Implementation Description Procedures
- (3) 231-318-334 CAMA, CCIS, CFTRK, DCHA, SCGA, TG, TGBVT, TGMEM, TKCONV, TMBCGA, and TRK—Trunk Translation Recent Change Formats
- (4) 231-290-600 Mobile Telephone Switching Office Feature—AUTOPLEX System 100
- (5) 231-290-604 Traffic Measurements Feature—AUTOPLEX System 100.

##### B. Other Documentation

- (1) Input Message Manual IM-6A001
- (2) Output Message Manual OM-6A001
- (3) Office Parameter Specification PA-6A001
- (4) Translation Guide TG-1A
- (5) Translation Output Configuration PA-6A002
- (6) Parameter Guide PG-1A.

#### 7. COMMENT FORM

**7.01** A comment form is located at the back of this practice to provide a communications channel from the user to the writer.

#### 8. ISSUING ORGANIZATION

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