

UNIVERGE SV9500

FP95-111 V1

Data Programming Manual - MFC

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UNIVERGE SV9500

Data Programming Manual - MFC

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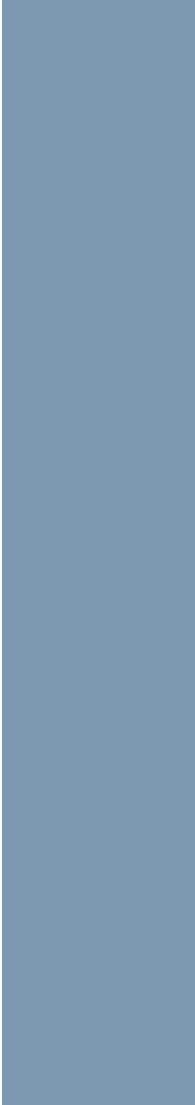
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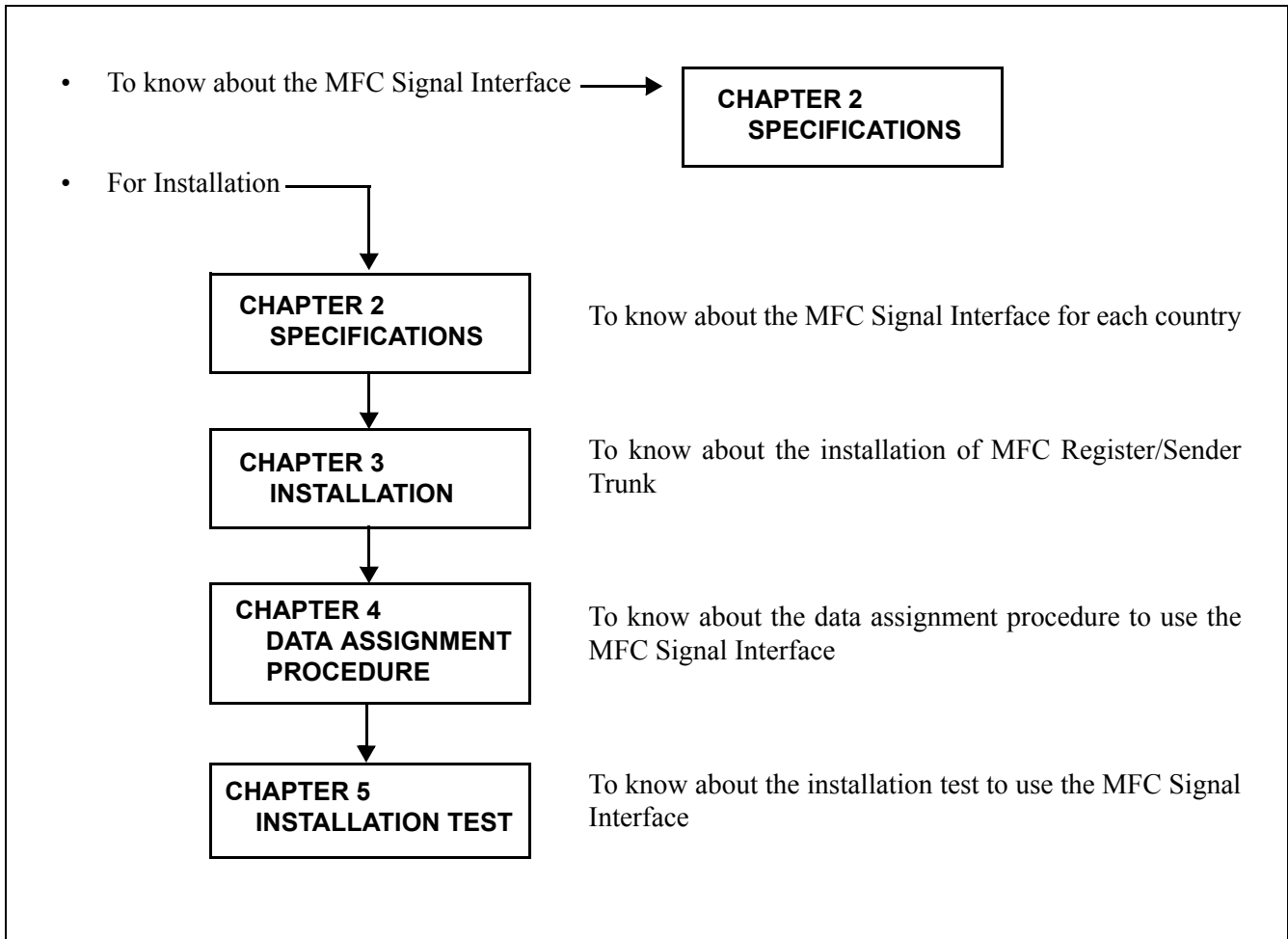
CHAPTER 1 GENERAL



1. Introduction

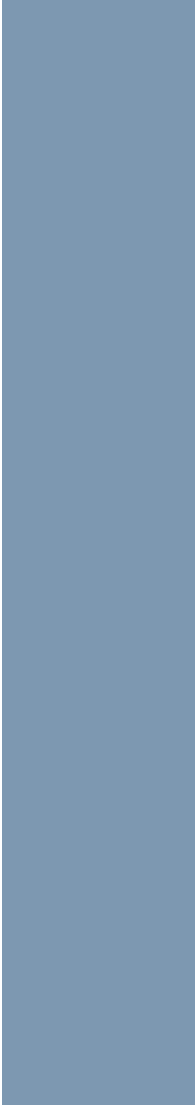
This manual describes the service feature, installation, data assignment procedure and installation test pertaining to MFC Signal Interface.

How to use CHAPTERs 2 to 5 is shown below:





CHAPTER 2 SPECIFICATIONS



1. GENERAL DESCRIPTION

The MFC Signal Interface service provides Direct Inward Dialing (DID) and Direct Outward Dialing (DOD) using the MFC signaling system.

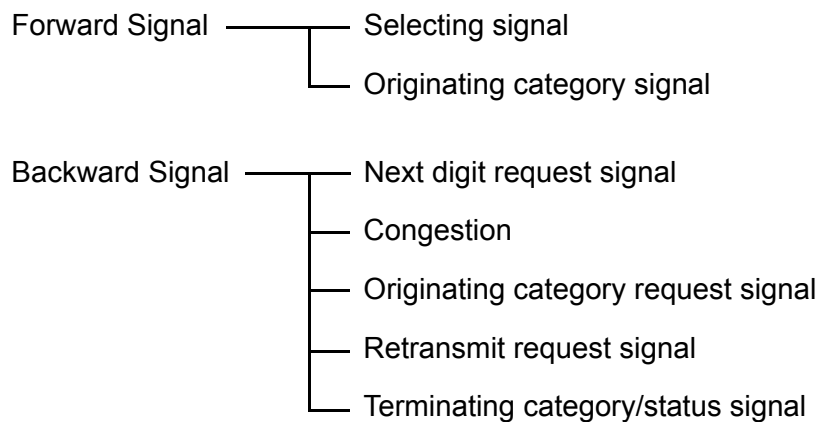
2. OUTLINE

The features of the Multi Frequency Code (MFC) signaling system are described below.

- Between an originating office and terminating office (end to end) (**Note 1**), 2 out of 6 MFC signals are used.
- Every time an originating office transmits a signal (forward signal), a response signal (backward signal) is sent back from the terminating office. While both are confirming the signal from the opposite office, the next signal is transmitted and received before shifting to a new state (Compelled Transmission Procedure).

shows the breakdown of the forward and backward signals.

Breakdown of the Forward and Backward Signals



Note 1: MFC-MFC (end to end) supports end to end MFC connections under the conditions on the next page.

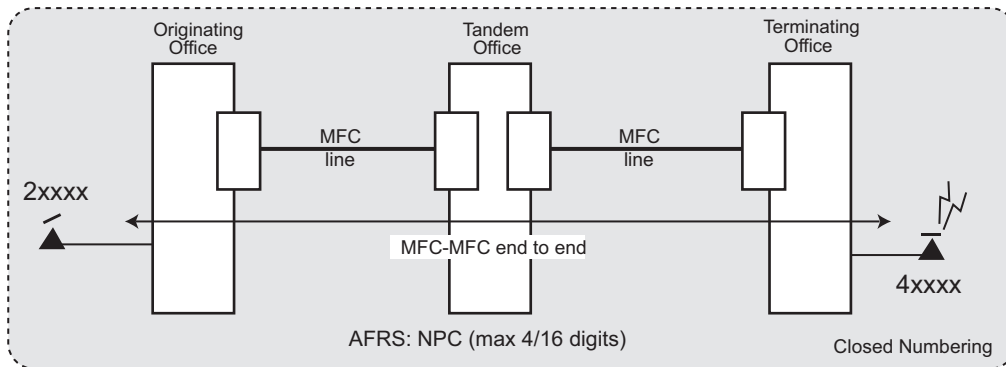
[Conditions]

- MFC specifications of the following countries do not support this feature.
 - Australia
 - Indonesia
 - Singapore/Malaysia
- Closed Numbering Plan is required for this feature.
- The maximum digits of access code used for determining MFC route at the tandem office are as follows:

NPC/NND Maximum Digit (Tandem Office)

<i>MFC Specifications</i>	<i>Maximum Digits of NPC (AFRS command)</i>	<i>Maximum Digits of NND (ANPD/ASPA command)</i>
<i>Thailand, Korea, Argentina/Philippines, Mexico, India, Kuwait</i>	<i>16 digits</i>	<i>6 digits</i>
<i>NEC standard, Venezuela, Brazil, Chile, Colombia</i>	<i>4 digits</i>	

MFC-MFC (end to end) Connection

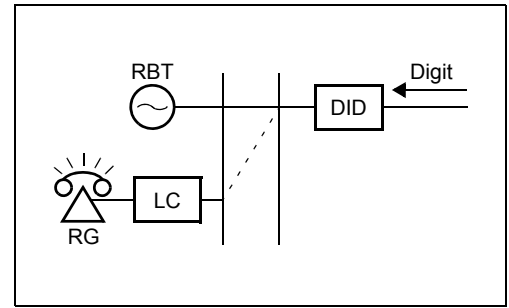


- MG-T1(SIP) [SCA-24DTIA-B/SCA-24DTIA/MG-24DTIA] does not support MFC and ANI (Automatic Number Identification).

2.1 Operating Procedure

(1) Direct Inward Dialing

- The outside calling party dials the telephone number of the station. The call is directly answered at that station without attendant assistance.



START

An outside party dials the number of the desired internal station directly.

The outside party receives Ringback Tone.

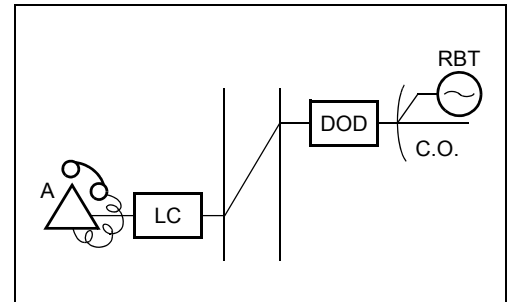
Ringing starts at the internal station.

The internal station lifts the handset.

The outside party and the internal station are connected without attendant assistance.

END

(2) Direct Outward Dialing (by Least Cost Routing)



START

Station "A" lifts the handset.

Station "A" receives Dial Tone.

Station "A" dials the Outgoing Call access code.

Station "A" dials the number of the desired outside party.

Station "A" receives Ring Back Tone.

END

2.2 Combination of Frequencies

The signals shown in the figure below are expressed by codes 1 to 15. Codes 1 to 15 are transmitted and received in a combination of 2 out of 6 frequencies. The table below and the table on the next page show the combination of the frequencies which the System transmits and receives.

Combination of Frequencies of the Forward Signal

FREQUENCY (Hz) CODE	1380	1500	1620	1740	1860	1980
1	×	×				
2	×		×			
3		×	×			
4	×			×		
5		×		×		
6			×	×		
7	×				×	
8		×			×	
9			×		×	
10				×	×	
11	×					×
12		×				×
13			×			×
14				×		×
15					×	×

×: Signals can be transmitted and received.

Combination of Frequencies of the Backward Signal

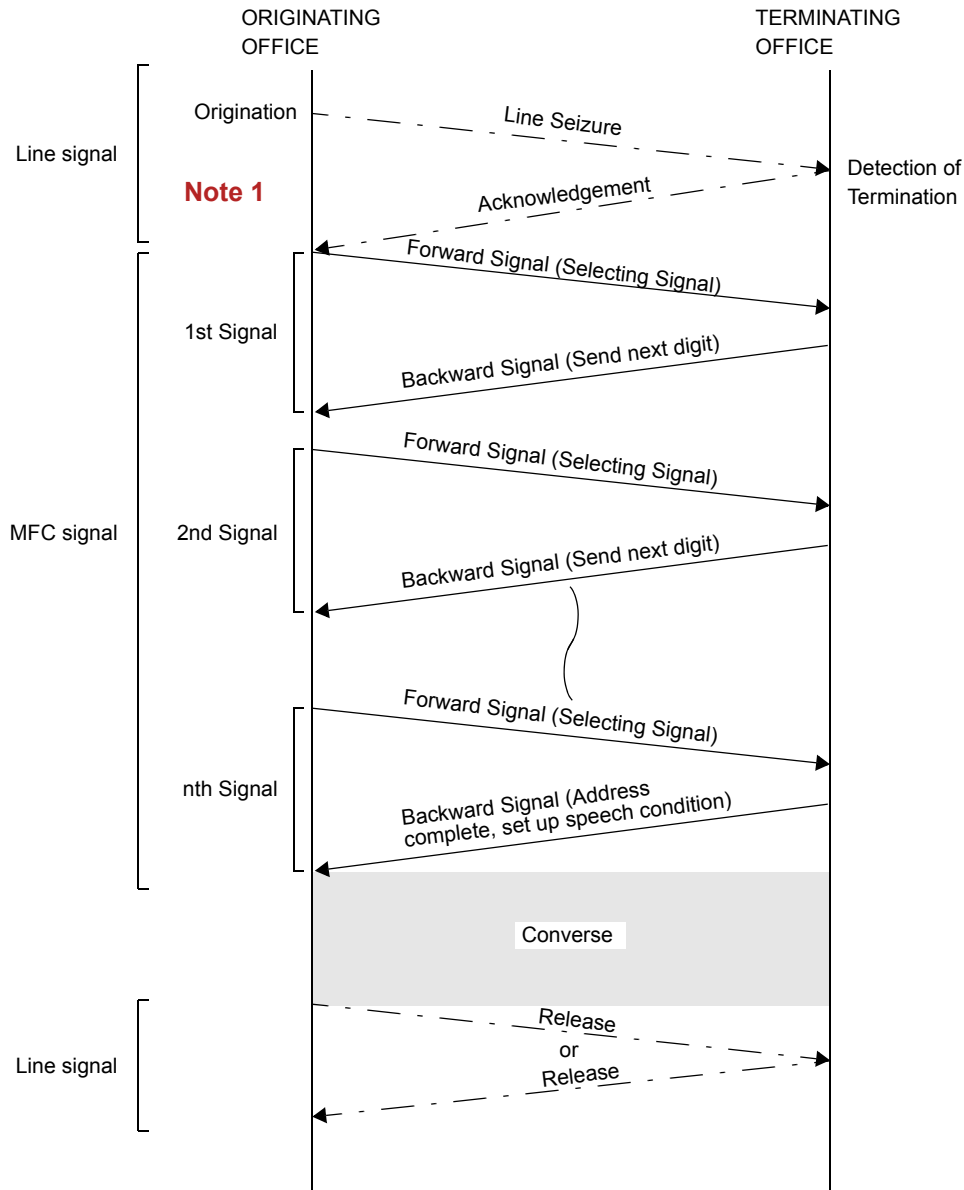
FREQUENCY (Hz) CODE	540	660	780	900	1020	1140
1					×	×
2				×		×
3				×	×	
4			×			×
5			×		×	
6			×	×		
7		×				×
8		×			×	
9		×		×		
10		×	×			
11	×					×
12	×				×	
13	×			×		
14	×		×			
15	×	×				

×: Signals can be transmitted and received.

2.3 Exchange of Signals between the Originating Office and Terminating Office

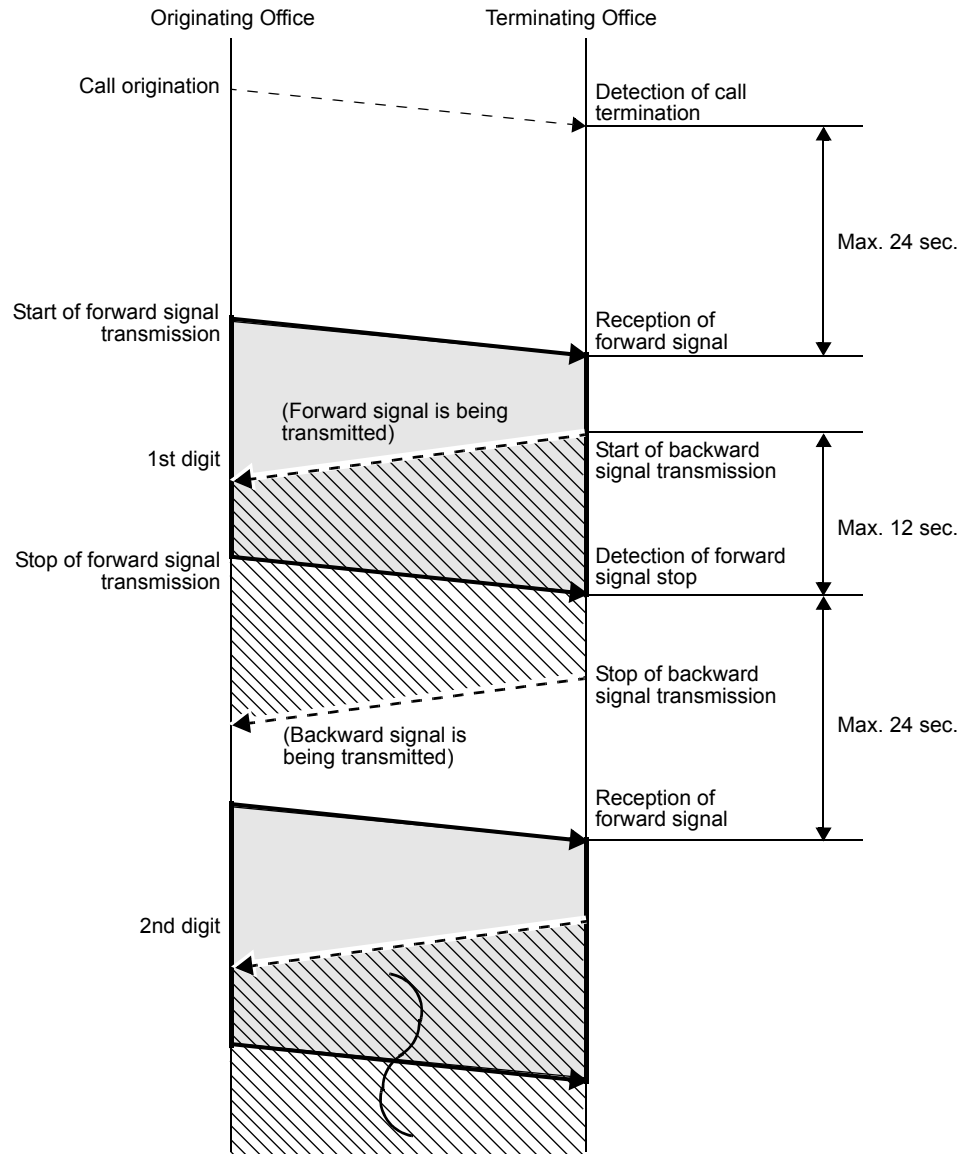
The table "Exchange of Signals between the Originating Office and Terminating Office" shows the exchange of signals between the originating office and terminating office, and "Time chart" on the next page shows the time chart of MFC signaling.

Exchange of Signals between the Originating Office and Terminating Office



Note 1: Outgoing/incoming signal interface for the MFC line is Second Dial Tone only. Accordingly, Forward Signal is sent regardless of Acknowledge signal.

Time chart



3. SPECIFICATIONS AND SERVICE CONDITIONS OF EACH COUNTRY

At present, each country has a different specification on the MFC. The table "[Specification of Each Country and the Functions](#)" shows the available connections on a country basis.

Specification of Each Country and the Functions

COUNTRY	DID with MFC	DOD with MFC		Tandem with MFC			Analog/Digital
		without ANI	with ANI	MFC→ CCIS ACIS	CCIS ACIS →MFC	MFC→ MFC	
NEC STANDARD (CCITT MFC-R2) (Next Page)	×	×	×	×	×	×	Analog/Digital
ARGENTINA/ PHILIPPINES	×	×	×	×	×	×	Digital
AUSTRALIA (D1301G)	×	—	—	×	—	—	Analog
BRAZIL	×	×	×	×	×	×	Analog/Digital
CHILE (CTC)	×	×	×	×	×	×	Digital
COLOMBIA	×	×	×	×	×	×	Digital
INDIA	×	×	×	×	×	×	Analog/Digital
INDONESIA (SMFC)	×	×	×	—	—	—	Analog/Digital
KOREA (KTA)	×	×	×	×	×	×	Analog
MEXICO	×	×	×	×	×	×	Digital
SINGAPORE (PSA)/ MALAYSIA	×	—	—	×	—	—	Analog
THAILAND (TOT)	×	×	×	×	×	×	Digital
VENEZUELA (CORPOVEN)	×	×	×	×	×	×	Digital
KUWAIT	×	×	×	×	×	×	Digital

× : Available

— : Not Used

3.1 NEC Standard (Complies with the CCITT MFC-R2)

The table "Contents of MFC Signaling-NEC Standard (Complies with the CCITT MFC-R2)" shows the meanings of the forward signal and backward signal.

3.1.1 Service Conditions pertaining to MFC Outgoing Call

- (1) The outgoing connection to the MFC line is available in the LCR or LCRS.
- (2) The terminals which can originate a DOD [D-9] call to the MFC line are stations (DP, PB, Desktop terminal) and ATTENDANT CONSOLE.
- (3) When originating a call to the MFC line from Data Terminal Equipment (DTE), it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (4) Outgoing Connection to the MFC line is available from the states given below.

• Station (idle status)	
• Station which places a station in hold	] CALL HOLD [C-6]
• Station which places a trunk in hold (tandem via station)	
• ATTENDANT CONSOLE [A-3](idle status)	
• INDIVIDUAL TRUNK ACCESS [I-4] from the ATTENDANT CONSOLE [A-3]	
• ATTENDANT CONSOLE [A-3] which places a station in hold	] CALL HOLD [C-6]
• ATTENDANT CONSOLE [A-3] which places a trunk in hold (tandem via ATTCON)	
- (5) For outgoing connection to the MFC line, the following service features are available.
 - CALL HOLD [C-6]
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - INCOMING CENTRAL OFFICE CALL TO TIELINE CONNECTION [I-3]
 - INDIVIDUAL TRUNK ACCESS (from ATT) [I-4]
 - LAST NUMBER CALL [L-6]
 - LEAST COST ROUTING-3/6 DIGIT [L-5]
 - OUTGOING TRUNK QUEUING (STA ring back queuing) [O-2]
 - OFF HOOK OUTGOING TRUNK QUEUING [O-7] (STA hold on queuing, tandem hold on queuing)
 - PEG COUNT [P-7]
 - RESTRICTION FROM OUTGOING CALLS [R-4]
 - SPEED CALLING-SYSTEM[S-3]
 - SPEED CALLING-GROUP [S-23]
 - SPEED CALLING-STATION [S-21]
 - STATION MESSAGE DETAIL SYSTEM [S-10]
 - TOLL DENIAL/TOLL DIVERSION [T-6]
 - TOLL RESTRICTION-3/6-DIGIT [T-7]

- (6) With the system the forward signal G-II is transmitted according to the calling party's SFC (Service Feature Restriction Class).
 - “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.1.2 Service Conditions pertaining to MFC Incoming Call

- (1) The terminals to which DID [D-8] calls can be terminated from the MFC line are stations (DP, PB, Desktop terminal), ATTENDANT CONSOLE [A-3].
- (2) For incoming call to the DTE from the MFC line, it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (3) When a Listed Directory Number (LDN) is received from the MFC line, calls are terminated to the ATTENDANT CONSOLE [A-3].
- (4) For TAS [T-8] connection, if TAS connection restriction (which is set by the “ACFR” command) is allowed, a backward signal indicating subscriber's line free is transmitted to the originating office even if the TAS Indicator is not assigned.
- (5) When a called party is idle, system sends the backward signal under the following conditions.
 - (a) G-II has not received and ARTD, parameter CDN24: OC=0 G-A=6
 - (b) G-II has received and ARTD, parameter CDN24: OC=1 G-B=6
(The call is terminated to the called party dialed irrespective of the forward signal G-II.)

(6) Depending on the state of the called party, the backward signal G-B will be either of the following:

• Called party busy.....	G-B=3
• Congestion.....	G-B=4
• Dead number	G-B=5
• Called party idle (charge).....	G-B=6
• Called party idle (charge) change to called party release.....	G-B=6
• LDN (ATT).....	G-B=6
• Intercept to ATTCN (called party is restricted).....	G-B=6
• Call Forwarding-All Calls to ATTCN.....	G-B=6
• Call Forwarding-Busy Line to ATTCN.....	G-B=6
• Night station (Station to which calls terminated to the ATTENDANT CONSOLE [A-3] are forwarded in the night mode)	G-B=6
• TAS Connection	G-B=6
• Tandem connection	G-B=6
• Call Forwarding-Outside.....	G-B=6
• Called party idle (no charge).....	G-B=7
• Lockout/Make Busy	G-B=8
• Restriction	G-B=8

(7) For incoming connection of the MFC line, the following service features are available.

- CALL FORWARDING ALL CALLS
- CALL FORWARDING BUSY LINE
- CALL FORWARDING DON'T ANSWER
- CALL PICK UP
- CALL QUEUING
- CALL WAITING-TERMINATING
- DISTINCTIVE RINGING
- IMMEDIATE RINGING
- INCOMING CALL IDENTIFICATION
- MULTI NUMBERING
- NIGHT CONNECTION
- PEG COUNT
- STATION HUNTING-CIRCULAR
- STATION HUNTING-TERMINAL
- STATION HUNTING-SECRETARIAL
- TRUNK ANSWER FROM ANY STATION (TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

3.1.3 Service Conditions pertaining to Tandem Connection

- (1) The following tandem connections are available for NEC STANDARD.

Incoming Trunk	Outgoing Trunk	Tandem Connection
MFC	Other than MFC	Available
Other than MFC	MFC	Available
MFC	MFC	Available

- (2) The outgoing connection to the MFC line is available in the LCR or LCRS.
- (3) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
- (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
- (4) OUTGOING TRUNK QUEUING is not available when the outgoing trunks are all busy at the tandem office (Incoming trunks are MFC).
- (5) Depending on the status of the called party, the backward signal G-B will be either of the following.
- Intercept to ATTCN (called party restriction) G-B=6
 - Tandem Connection G-B=6
 - Call Forwarding to Outside G-B=6
 - Dead Number G-B=5
 - Congestion G-B=4
 - Restriction G-B=8
- (6) The MFC signaling link is established between the end offices when MFC-MFC tandem connection.
- (7) The following service features are not available at the call originating office when MFC-MFC tandem connection.
- SPEED CALLING-SYSTEM [S-3]
 SPEED CALLING-STATION [S-21]
 SPEED CALLING-GROUP [S-23]

- (8) With the system the forward signal G-II is fixed at “2” (Subscriber with Priority) when tandem connection with the “other than MFC Incoming trunk” and “MFC outgoing trunk”.

When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:

- G-II=1 Subscriber without Priority
- G-II=2 Subscriber with Priority

When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.

Contents of MFC Signaling-NEC Standard (Complies with the CCITT MFC-R2)

NEC Standard (CCITT MFC-R2)				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP-I (G-I)	GROUP-II (G-II) Note 1	GROUP-A (G-A)	GROUP-B (G-B)
1	Digit “1”	Subscriber without Priority	Send Next Digit (N+1)	—
2	Digit “2”	Subscriber with Priority	Send Last but One Digit (N-1)	~~Send Special Information Tone~~
3	Digit “3”	Maintenance Equipment	Address Complete, Changeover to Reception of G-II	Subscriber’s Line Busy
4	Digit “4”	—	Congestion in the National Network	Congestion, Encountered after Changeover from G-A Signal to G-B Signal
5	Digit “5”	Operator	Calling Party Category	Unallocated Number
6	Digit “6”	Data Transmission	Address Complete, Change Set Up Speech Condition	Subscriber’s Line Free (Charge)
7	Digit “7”	Subscriber or Operator without Forward Transfer Facility	Send Last but Two Digits (N-2)	Subscriber’s Line Free (No Charge)
8	Digit “8”	Data Transmission	Send Last but Three Digits (N-3)	Subscriber’s Line Out of Order
9	Digit “9”	Subscriber with Priority	—	—
10	Digit “0”	Operator with Forward Transfer Facility	—	—

Contents of MFC Signaling-NEC Standard (Complies with the CCITT MFC-R2)

NEC Standard (CCITT MFC-R2)				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP-I (G-I)	GROUP-II (G-II) Note 1	GROUP-A (G-A)	GROUP-B (G-B)
11	Digit “*”	—	—	—
12	Digit “#”	—	—	—
13 14 15	—	—	—	—

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

Note 1: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

3.2 ARGENTINA/PHILIPPINES

The table "Contents of MFC Signaling for ARGENTINA/PHILIPPINES" shows the meanings of the forward signal and backward signal.

3.2.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as “LCR” or “LCRS” in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by the DTX key operations on a Desktop terminal with MODEM POOLING.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk
 - Station by INDIVIDUAL TRUNK ACCESS
 - Tandem connection
 - Attendant Console without a held station/trunk

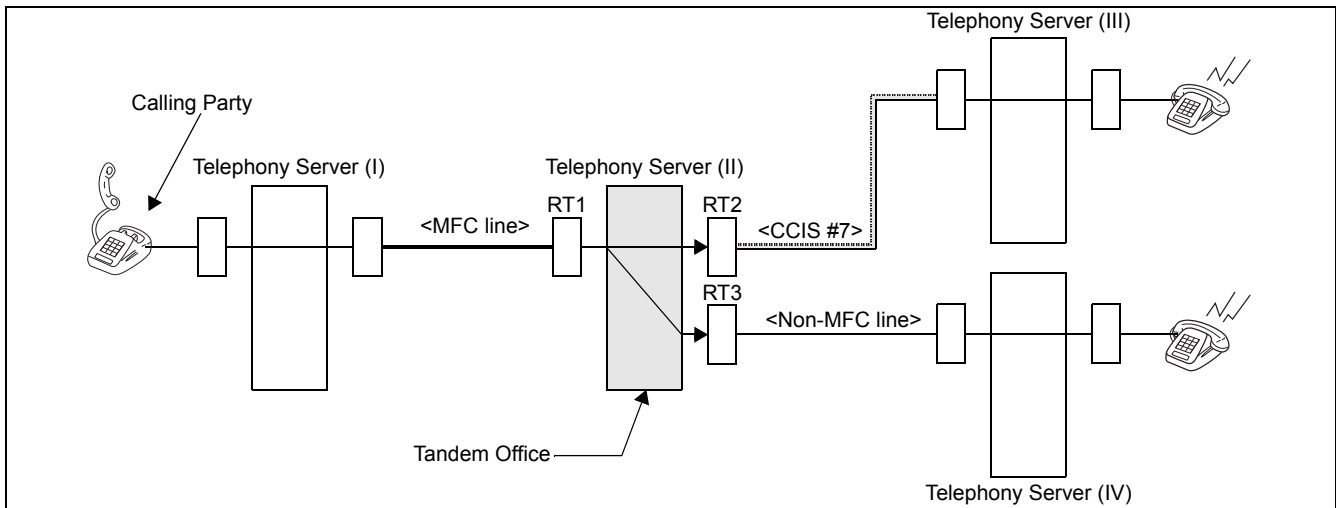
- Attendant Console by INDIVIDUAL TRUNK ACCESS
 - Attendant Console with a held station
 - Attendant Console with a held trunk
- (5) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
- (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

- (6) The following service features are available for MFC outgoing calls.
- CALL HOLD
 - CALL FORWARDING-ALL CALLS/CALL FORWARDING-ALL CALLS-OUTSIDE
 - CALL FORWARDING-BUSY LINE/CALL FORWARDING-BUSY LINE-OUTSIDE
 - INCOMING CENTRAL OFFICE CALL TO TIE LINE CONNECTION
 - INDIVIDUAL TRUNK ACCESS (from ATT)
 - LAST NUMBER CALL
 - LEAST-COST ROUTING - 3/6-DIGIT
 - OUTGOING TRUNK QUEUING (STA Ring Back Queuing, STA Hold on Queuing, TANDEM Hold on Queuing)
 - PEG COUNT
 - RESTRICTION FROM OUTGOING CALL
 - SPEED CALLING
 - STATION MESSAGE DETAIL RECORDING (SMDR)
 - TOLL DENIAL/TOLL DIVERSION
 - TOLL RESTRICTION - 3/6-DIGIT
 - TRUNK TO TRUNK CONNECTION
- (7) Even if an originating office receives Group-II signal “B1 (= Charge Calling Party Release)” from a terminating office, release of MFC trunks conforms to Route Data (Calling Party Release/Called Party Release) of the originating office.
- (8) When the system received G-A “1” signal as a backward signal for the last digit of G-I, it sends G-I “15” under the following condition.
- (a) G-I=“15” (End of digits) is sent out..... ASYD, sysl, Index 126 bit 7=0
 - (b) G-I=“15” (End of digits) is not sent out (Waiting for Backward signal)
..... ASYD, sysl, Index 126 bit 7=1
- (9) When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:
- G-II=1 Subscriber without Priority
 - G-II=2 Subscriber with Priority
- When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.
- “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.2.2 Service Conditions pertaining to MFC Incoming Call

- (1) A DID call can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (2) Call termination to DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal with MODEM POOLING.
- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).
- (4) Under the following tandem connection, from an MFC line to a CCIS#7/Non-MFC line, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 must be assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to Non-MFC)



Note: In the figure above, when receiving Group-II signal (ARTD/ARTDN OC=1) or Called Party Number (ARTD/ARTDN OC=0), Telephony Server (II) allows or restricts the tandem connection (ARRC/ARRCN) between MFC and CCIS, then returns a backward signal (Group-B signal) to Telephony Server (I) regardless of status (idle, busy or restricted) of the called party accommodated in Telephony Server (III). Telephony Server (II) does not return a backward signal after receiving the status of the called party. For tandem connections from MFC line to lines other than CCIS, a relay office returns a backward signal with the same timing.

- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Called Party Idle” to the originating office, even if the TAS information has not been assigned by the ATAS command at the terminating office.

- (6) When a called party is idle, the incoming call is connected to the called party regardless of the received Group-II signal. This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.
- (7) Depending upon the called party status, the following codes are transmitted as Group-B signalling:
- Called party idle (charge), change calling party release G-B=6
 - Called party busy G-B=3
 - Congestion G-B=4
 - Dead Number G-B=5
 - Called party idle (charge)..... G-B=6
 - LDN (ATT) G-B=6
 - Intercept to ATT (called party is restricted)..... G-B=6
 - Call forwarding all calls to ATT G-B=6
 - Call forwarding busy line to ATT G-B=6
 - Night station..... G-B=6
 - TAS connection..... G-B=6

3.2.3 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows.

<ANI Information> = <Class Information> + <Calling Number>

- (a) Class Information (1 digit): Signifies “Calling Party Category” which is transmitted as a Group-II Forward Signal. As the “Calling Party Category”, the following two types can be selected depending upon SFC (Service Feature Restriction Class).
- Group-II CODE=1: Subscriber without Priority (can be designated by SFI 91=1)
 - Group-II CODE=2: Subscriber with Priority (can be designated by SFI 91=0)
- (b) Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).
- Station number of the calling party
 - Listed Directory Number which can be assigned in the AANI command on a TN basis
- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.
- (3) Depending upon data assignment in the AANI command, the following two alternatives are available.
- (a) When “*” or “#” is assigned at “LS” in the AANI command:

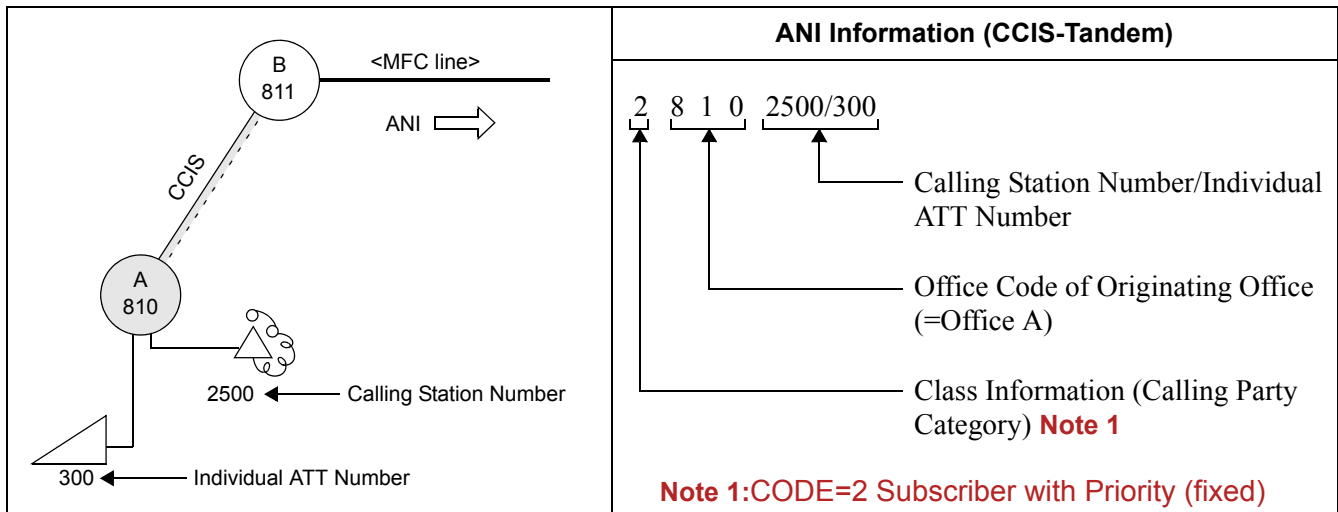
<ANI Information> =	Calling Party Category	+	Station Number
	<Class Information>		<Calling Number>

- (b) When numerical information is assigned at “LS” in the AANI command:

$$\begin{array}{c} \text{<ANI Information>} \\ \text{<Class Information>} \end{array} = \begin{array}{|c|} \hline \text{Calling Party Category} \\ \hline \end{array} + \begin{array}{|c|c|} \hline \text{Office Code} & \text{Station Number} \\ \hline \end{array} \begin{array}{c} \text{<Calling Number>} \end{array}$$

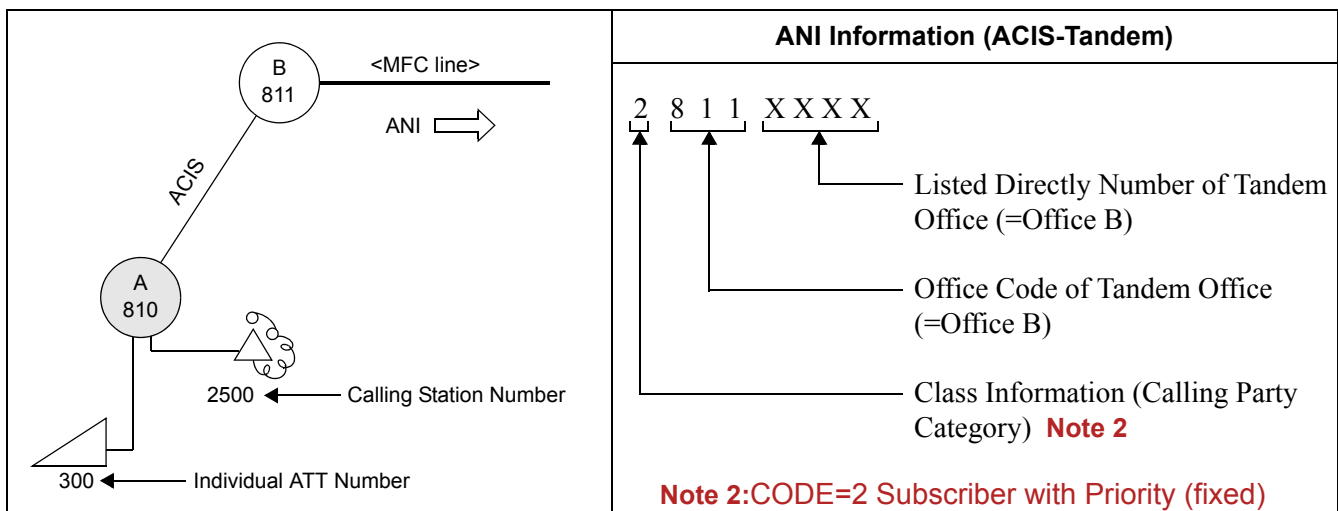
- (4) As the Calling Number, only numerical information (0 ~ 9) is used. “*” and “#” can not be transmitted.
- (5) When Tandem Connection is involved, the transmitted ANI information is comprised as shown on the next page depending upon the Interoffice Signaling type (CCIS/ACIS).
 - (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7).

CCIS-Tandem



- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

ACIS-Tandem



(6) Depending on the state of the called party, the backward signal G-B will be either of the following.

• Called party idle (charge) change calling party release	G-B=6
• Called party busy.....	G-B=3
• Congestion.....	G-B=4
• Dead Number	G-B=5
• Called party idle (charge).....	G-B=6
• LDN (ATTCON)	G-B=6
• Intercept to ATTCON (Called Party Restriction).....	G-B=6
• Call Forwarding all calls to ATTCON	G-B=6
• Call Forwarding busy line to ATTCON	G-B=6
• Night Station	G-B=6
• TAS Connection	G-B=6
• Tandem Connection.....	G-B=6
• Call Forwarding-Outside.....	G-B=6
• Called Party Idle (no charge).....	G-B=7
• Lockout/Make Busy	G-B=8
• Restriction	G-B=8

(7) With regard to an MFC Incoming Call, the following service features are available:

- CALL FORWARDING-ALL CALLS
- CALL FORWARDING-BUSY LINE
- CALL FORWARDING-DON'T ANSWER
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- CALL FORWARDING-OUTSIDE (from Night Station Call)
- CALL FORWARDING Intercept to Station/ATT
- CALL PICKUP
- CALL QUEUING
- CALL WAITING-TERMINATING
- DISTINCTIVE RINGING
- IMMEDIATE RINGING
- INCOMING CALL IDENTIFICATION
- MULTI NUMBERING
- NIGHT CONNECTION
- PEG COUNT
- STATION HUNTING-CIRCULAR
- STATION HUNTING-TERMINAL
- STATION HUNTING-SECRETARIAL
- TRUNK ANSWER FROM ANY STATION (TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

Contents of MFC Signaling for ARGENTINA/PHILIPPINES

ARGENTINA/PHILIPPINES				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP I/III	GROUP II Note 3	GROUP-A	GROUP-B
1	Digit “1”	Subscriber without Priority	Send Next Digit (N+1)	—
2	Digit “2”	Subscriber with Priority	Send Last but One Digit (N-1)	Send Recorded Messages
3	Digit “3”	Maintenance Equipment	Address Complete, Change-over to Group-B Signal	Subscriber’s Line Busy
4	Digit “4”	Coin Phone	Congestion	Congestion
5	Digit “5”	Attendant	Send Category of Calling Subscriber	Unallocated number
6	Digit “6”	Data Transmission	Address Complete, Change Setup Speech Conditions	Subscriber’s Line Free with Charge
7	Digit “7”	—	Send Last but Two Digits (N-2)	Subscriber’s Line Free without Charge
8	Digit “8”	—	Send Last but Three Digits (N-3)	Subscriber’s Line Out of Order
9	Digit “9”	—	Send Last Digit (N)	—
10	Digit “0”	—	Send First Digit	—
11	Digit “*”	—	—	—
12	Digit “#”	—	—	—
13	~~Access to Test Equipment~~	—	—	—
14	—	—	—	—
15	End of Pulsing	—	—	—

Contents of MFC Signaling for ARGENTINA/PHILIPPINES

ARGENTINA/PHILIPPINES				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP I/III	GROUP II Note 3	GROUP-A	GROUP-B

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

Note 3: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

3.3 AUSTRALIA (D1301G Specification)

Note: In the Australian system, DOD [D-9] to the MFC line is not used at present.

The table "Contents of MFC Signaling for AUSTRALIA (Telecom Specification)" shows the meaning of the forward signal and backward signal.

3.3.1 Service Conditions pertaining to MFC Incoming Call

- (1) The terminals to which DID [D-8] calls can be terminated from the MFC line are stations (DP, PB, Desktop terminal), ATTENDANT CONSOLE [A-3].
- (2) For incoming call to the DTE from the MFC line, it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (3) When a Listed Directory Number (LDN) is received from the MFC line, calls are terminated to the ATTENDANT CONSOLE [A-3].
- (4) For TAS [T-8] connection, if TAS connection restriction (which is set by the "ACFR" command) is allowed, a backward signal indicating subscriber's line free is transmitted to the originating office even if the TAS Indicator is not assigned.
- (5) When a called party is idle, the call is terminated to the following terminal with respecting G-II signal which received from the originating office.
 - (a) G-II = "1" (Operator) and ARTD, parameter CDN23: TR=0..... ATTCON
 - (b) G-II = "8" (Overseas Operator) and ARTD, parameter CDN23: TR=0 ATTCON
 - (c) In the case other than above (a), (b), the call terminate to the called party which dialed.
- (6) Even if the G-B signal is "6" (called party control), when the originating office is released, the call is released.
- (7) Depending on the state of the called party, the backward signal G-B will be either of the following:

• Called party idle (charge)	G-B=1
• LDN (ATTCON)	G-B=1
• Intercept to ATTCON (Called party is restricted)	G-B=1
• Call Forwarding-All Calls to ATTCON	G-B=1
• Call Forwarding-Busy Line to ATTCON	G-B=1
• Night station (Station to which calls terminated to the ATTCON are forwarded in the night mode)	G-B=1
• Called party busy	G-B=2
• Lockout/Make Busy	G-B=2
• Dead number	G-B=2
• Congestion	G-B=2
• Restriction	G-B=2
• Called party idle (no charge)	G-B=5
• Called party idle (charge) change to called party release	G-B=6

- TAS connection G-B=1
- Tandem Connection..... G-B=1
- Call Forwarding-Outside..... G-B=1

(8) For incoming Call from the MFC line, service features given below are available.

- CALL FORWARDING-BUSY LINE [C-2]
 - CALL FORWARDING-DON'T ANSWER [C-3]
 - CALL FORWARDING-ALL CALLS [C-5]
 - CALL FORWARDING-INTERCEPT/ANNOUNCEMENT [C-25]
 - CALL FORWARDING-OUTSIDE [C-28]
 - CALL PICKUP-GROUP [C-7]
 - CALL PICKUP-DIRECT [C-30]
 - CALL QUEUING [C-9]
 - CALL WAITING-TERMINATING..... [C-12]
 - DISTINCTIVE RINGING [D-10]
 - FLEXIBLE NUMBERING OF STATIONS [F-1]
 - IMMEDIATE RINGING..... [I-1]
 - INCOMING CALL IDENTIFICATION [I-2]
 - NIGHT CONNECTION-FIXED [N-1]
 - NIGHT CONNECTION-FLEXIBLE [N-2]
 - NIGHT CONNECTION SYSTEM-OUTSIDE [N-17]
 - PEG COUNT..... [P-7]
 - STATION HUNTING-CIRCULAR..... [S-7]
 - STATION HUNTING-SECRETARIAL [S-8]
 - STATION HUNTING-TERMINAL [S-9]
 - TRUNK ANSWER FROM ANY STATION (TAS) [T-8]
 - TENANT SERVICE..... [T-12]
 - UNIFORM CALL DISTRIBUTION [U-1]
- “*” and “#” are available for the Group I (G-I) signal.

3.3.2 Service Conditions pertaining to Tandem Connection

- (1) The following connections are available for Australia.

Incoming Trunk	Outgoing Trunk	Tandem Connection
MFC	Other than MFC	Available
Other than MFC	MFC	Not Available
MFC	MFC	Not Available

- (2) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
- (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
- (3) OUTGOING TRUNK QUEUING is not available when the outgoing trunks are all busy at the tandem office.
- (4) Depending on the status of the called party, the backward signal G-B will be either of the following.
- Intercept to ATT (called party restriction)..... G-B=1
 - Tandem Connection..... G-B=1
 - Call Forwarding to Outside G-B=1
 - Dead Number G-B=2
 - Congestion..... G-B=2
 - Restriction G-B=2

Contents of MFC Signaling for AUSTRALIA (Telecom Specification)

AUSTRALIA (Telecom Specification)				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP-I (G-I)	GROUP-II (G-II)	GROUP-A (G-A)	GROUP-B (G-B)
1	Digit “1”	Operator	Send Next Digit (N+1)	Called Party Idle
2	Digit “2”	Subscriber or Coin Telephone	Send First Digit	Called Party Busy
3	Digit “3”	Test Position	Address Complete Change Over to Reception of G-B	~~No line Out Before Answer~~
4	Digit “4”	Interception Center or Remote Operation Center	~~Start DP 1st Digit~~	~~Congestion~~
5	Digit “5”	Coin Telephone	~~Start DP 2nd Digit~~	Called Party Idle (No Charge)
6	Digit “6”	Data Telephone	~~Start DP 3rd Digit~~	Called Party Idle Control No Time Out Before Answer
7	Digit “7”	Overseas Subscriber	~~Start DP 4th Digit~~	~~Called Party Idle; Called Party Control No Charge~~
8	Digit “8”	Overseas Operators	~~Start DP 5th Digit~~	~~Called Party Interception~~
9	Digit “9”	Subscriber	Send Calling Party Access Info	~~Send Calling Party Access Info~~
10	Digit “0”	Used by Public Subscriber	~~Send Previous Digit MFC~~	—
11	Digit “*”	—	—	—
12	Digit “#”	—	—	—
13 ~ 15	—	—	—	—

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

3.4 BRAZIL

The table "Contents of MFC Signaling for BRAZIL" provides the meanings of the forward signal and backward signal.

3.4.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as "LCR" or "LCRS" in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by the DTX key operations on a Desktop terminal with MODEM POOLING.
- (4) Under the following status, MFC trunk access is permitted.
 - station without a held station/trunk
 - station by Individual Trunk Access
 - station with a held station
 - station with a held trunk
 - tandem connection
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk Access
 - Attendant Console with a held station
 - Attendant Console with a held trunk
- (5) The forward signal G-II is fixed at "2" (Subscriber with Priority) when a tandem connection with non-MFC lines is involved.

When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:

- G-II = 1 Subscriber without Priority
- G-II = 6 Data Transmission

When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC = 0 must not be assigned to stations in a CCIS network.

- (6) When the system received G-A "1" signal as a backward signal for the last digit of G-I, G-I "15" may be sent under the following condition.
 - (a) G-I="15" (End of digits) is sent out.....ASYD, sys1, Index 126 bit 7=0
 - (b) G-I="15" (End of digits) is not sent out (Waiting for Backward signal)
.....ASYD, sys1, Index 126 bit 7=1

- (7) Regardless of reception of G-B signal “6” (Called Party Based Release) from a terminating office, release of MFC trunks conforms to Route Data (Calling Party Release/Called Party Release) of the system.
- (8) “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.4.2 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows.

<ANI Information> = <Class Information> + <Calling Number>

- (a) Class Information (1 digit): Signifies “Calling Party Category” which is transmitted as a Group-II Forward Signal. As the “Calling Party Category”, the following two types can be selected depending upon SFC (Service Feature Restriction Class).
 - Group-II CODE=1: Subscriber without Priority (can be designated by SFI 91=1)
 - Group-II CODE=6: Data Transmission
 - (b) Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).
 - Station number of the calling party
 - Listed Directory Number which can be assigned in the AANI command on a TN basis
- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.
 - (3) Depending upon data assignment in the AANI command, the following two alternatives are available.
 - (a) When “*” or “#” is assigned at “LS” in the AANI command:

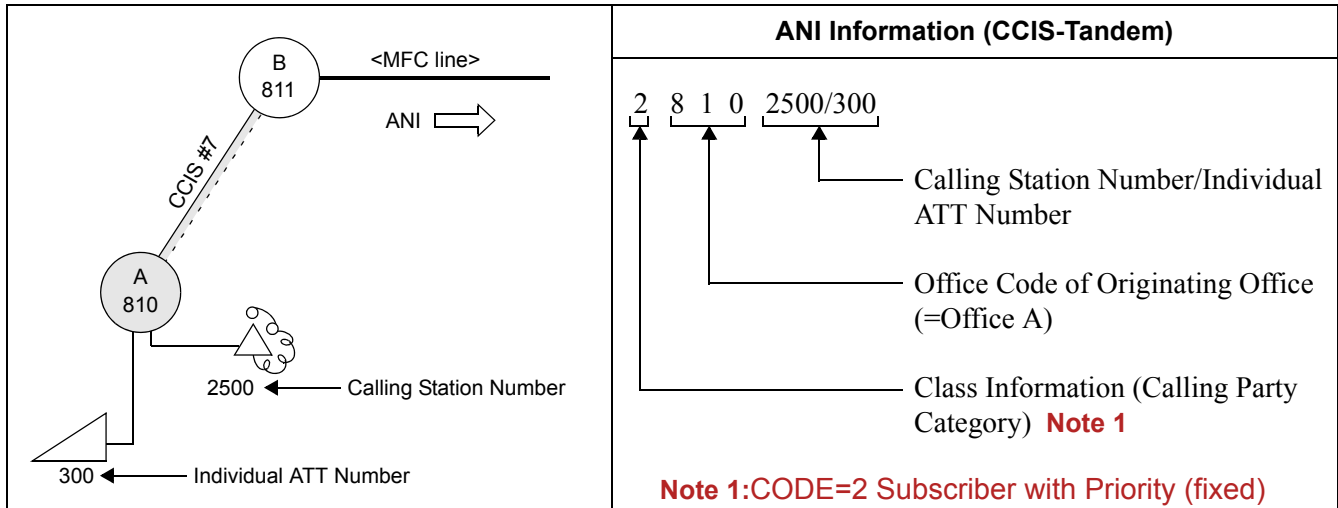
$$\begin{array}{ccccc} \text{<ANI Information>} & = & \boxed{\text{Calling Party Category}} & + & \boxed{\text{Station Number}} \\ & & \text{<Class Information>} & & \text{<Calling Number>} \end{array}$$

- (b) When numerical information is assigned at “LS” in the AANI command:

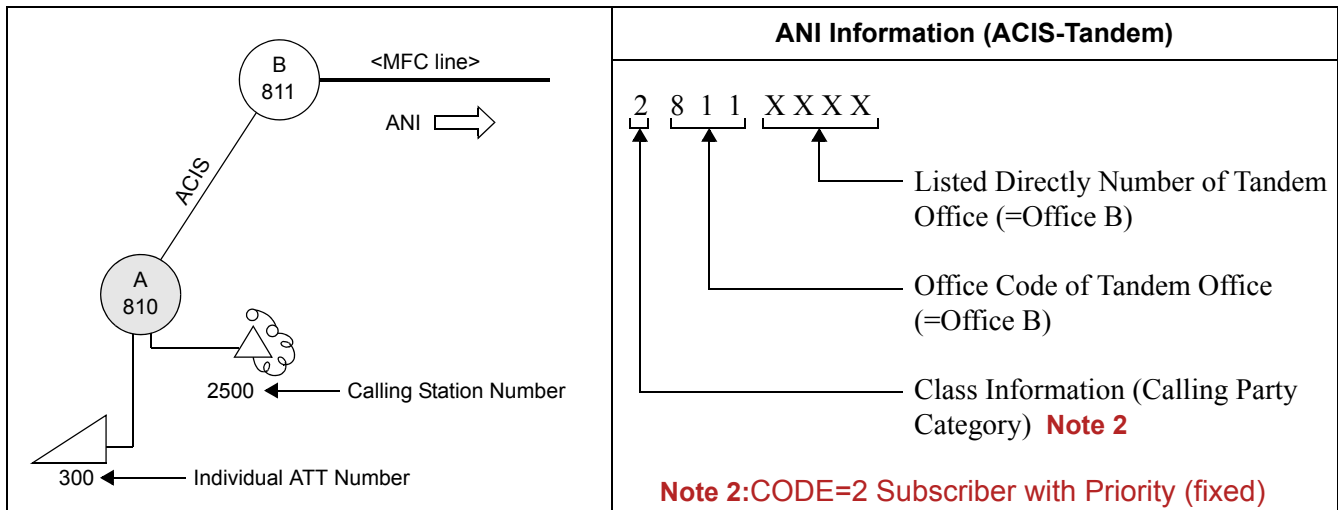
$$\begin{array}{ccccc} \text{<ANI Information>} & = & \boxed{\text{Calling Party Category}} & + & \boxed{\text{Office Code} \quad \text{Station Number}} \\ & & \text{<Class Information>} & & \text{<Calling Number>} \end{array}$$

- (4) As the Calling Number, only numerical information (0 ~ 9) is used. “*” and “#” can not be transmitted.

- (5) When Tandem Connection is involved, the transmitted ANI information is comprised as shown below depending upon the Interoffice Signalling type (CCIS/ACIS).
- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7).

CCIS-Tandem

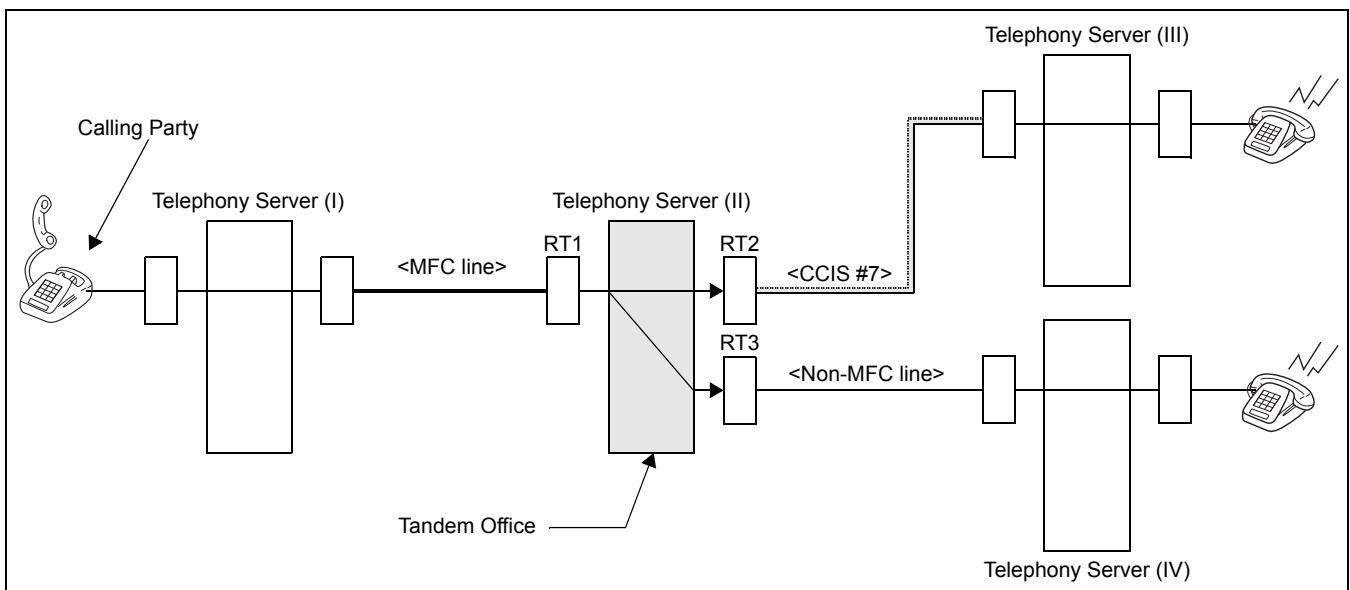
- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

ACIS-Tandem

3.4.3 Service Conditions pertaining to MFC Incoming Call

- (1) A DID call can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (2) Call termination to DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal with MODEM POOLING.
- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).
- (4) Under the following tandem connection, from an MFC line to a CCIS #7/Non-MFC line, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 are assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to Non-MFC)



Note: In the figure above, when receiving Group-II signal (ARTD/ARTDN OC=1) or Called Party Number (ARTD/ARTDN OC=0), Telephony Server (II) allows or restricts the tandem connection (ARRC/ARRCN) between MFC and CCIS, then returns a backward signal (Group-B signal) to Telephony Server (I) regardless of status (idle, busy or restricted) of the called party accommodated in Telephony Server (III). Telephony Server (II) does not return a backward signal after receiving the status of the called party. For tandem connections from MFC line to lines other than CCIS, a relay office returns a backward signal with the same timing.

- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Called Party Idle” to the originating office, even if the TAS information has not been assigned in the ATAS command at the terminating office.

- (6) When a called party is idle, the incoming call is connected to the called party on receipt of one of the following Forward Signals (Group-II):

CODE	CONTENTS
1	Ordinary Subscriber
2	Subscriber with Special Charging
4	Local Public Call Box
6	Data Transmission

(This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.)

Regardless of the called party status (idle/busy), the incoming call is connected to the following terminals on receipt of one of the following Forward Signals (Group-II):

CODE	CONTENTS
3	Maintenance Equipment
5	Operator Subscriber with Special Charging
7	National Public Call Box Ordinary Subscriber
8	Data Transmission International Working
9	Subscriber with Priority International Working
10	Operator with Forward Transfer Facility International Working

The incoming calls are connected to an operator (Day Mode)/Night STN (Night Mode).

- (7) With regard to an MFC Incoming Call, the following service features are available:

- CALL FORWARDING-ALL CALLS
- CALL FORWARDING-BUSY LINE
- CALL FORWARDING-DON'T ANSWER
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- CALL FORWARDING-OUTSIDE (from Night Station Call)
- CALL FORWARDING Intercept to Station/ATT
- CALL PICKUP
- CALL QUEUING
- CALL WAITING-TERMINATING
- DISTINCTIVE RINGING
- IMMEDIATE RINGING
- INCOMING CALL IDENTIFICATION
- MULTI NUMBERING
- NIGHT CONNECTION
- PEG COUNT
- STATION HUNTING-CIRCULAR
- STATION HUNTING-TERMINAL
- STATION HUNTING-SECRETARIAL
- TRUNK ANSWER FROM ANY STATION(TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

- (8) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
- (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

3.4.4 Service Feature Description : COLLECT CALL BLOCKING

1. GENERAL DESCRIPTION

This feature allows a station to restrict collect calls from the C.O. line.

Operating procedure for this feature can be determined by system data as shown below:

- ASYD, SYS 1, INDEX 400, Bit 0=0
To notify the called station is not allowed to receive collect calls, the system returns the backward signal “Collect Call Blocking” to the opposite office when a collect call is terminated.
The called station does not ring.
- ASYD, SYS 1, INDEX 400, Bit 0=1
To notify the called station is not allowed to receive collect calls, the system returns Collect Call Blocking signal when the called party answers.

2. OPERATING PROCEDURE

- When a call is terminated to a station not allowed to receive collect calls

-ASYD, SYS 1, INDEX 400, Bit 0=0

- (1) When an MFC DID incoming call is terminated, the system returns the backward signal “Collect Call Blocking”.
- (2) The incoming trunk is released.

-ASYD, SYS 1, INDEX 400, Bit 0=1

- (1) When an MFC DID incoming call is terminated, the called station rings. When the called station is a Desk-top terminal, the LCD displays as shown below.

COLECT (CLCT)	DDD	1
------------------	-----	---

- (2) When the called party answers, Collect Call Blocking signal is sent to the opposite office.
- (3) The incoming trunk is released. The called party hears Reorder Tone.
- (4) The called party hangs up.

- When a call is terminated to a station allowed to receive collect calls

- (1) When an MFC DID incoming call is terminated, the called station rings. When the called station is a Desk-top terminal, the LCD displays as shown below.

COLECT (CLCT)	DDD	1
------------------	-----	---

- (2) When the called party answers, Answer signal is sent to the opposite office.
- (3) The connection is established.

- How to answer the call terminated to a station not allowed to receive collect calls

-ASYD, SYS 1, INDEX 400, Bit 0=0

In this case, the collect call cannot be answered because the incoming trunk is released when the backward signal is returned to the opposite office.

-ASYD, SYS 1, INDEX 400, Bit 0=1

- (1) When an MFC DID incoming call is terminated, the called station rings. When the called station is a Desktop terminal, the LCD displays as shown below.

COLECT	DDD	1
(CLCT)		

- (2) The call is picked up using such features as Call Pickup from a station allowed to receive collect calls. Answer signal is sent to the opposite office.

Note: When an incoming call is not a collect call, "CLCT" indication on the Desktop terminal LCD is not displayed.

3. SERVICE CONDITIONS

- (1) This feature is available only for MFC DID incoming calls.
- (2) When the system is in Day mode, if the received G-I signal is not a station number, the collect call is transferred to the Attendant. Accordingly, whether to allow or restrict the collect call is determined according to Service Feature Restriction Class of the Attendant.
- (3) When the system is in Night mode, if the received G-I signal is not a station number, the collect call is transferred to the Night Station. Accordingly, whether to allow or restrict the collect call is determined according to Service Feature Restriction Class of the Night Station.
- (4) The following circuit card is required for this feature.

MFC Sender/Receiver:	PA-4MFCA	SP-1075 4MFCA PROG-C
MFC Sender/Receiver:	PA-4MFCA-B	
Outgoing trunk:	PA-8TLTR-A	SP-3026 8TLTR PROG-B
Outgoing trunk:	PA-8TLTR-B	
Digital Trunk Interface:	PA-PRTC, CH-PRTA	

(5) Service conditions differ depending on the system data as shown below.

-ASYD, SYS 1, INDEX 400, Bit 0=0

- a. When the forward signal GII=8 is received, the incoming call is regarded as a collect call. (Refer to Contents of MFC Signaling for BRAZIL for details on each signal.)
- b. When the called party is not allowed to receive collect calls, the backward signal in response to the GII=8 signal is determined by ARTI command.
 - ARTI, parameter CDN56: CLBK=0: GB=7
 - ARTI, parameter CDN56: CLBK=1: GB=3

-ASYD, SYS 1, INDEX 400, Bit 0=1

- a. When a station is not allowed to receive collect calls, if the station answers a collect call, Collect Call Blocking signal is sent to the opposite office regardless of the kind of GII signal.
 - b. Even if the Collect Call Blocking signal is sent by answering the call, switch connection between the incoming trunk and the station is established.
 - c. Trunk release method differs depending on the route data of the incoming route.
 - ARTD, parameter CDN8: RLP=0: Calling Party Release
 - ARTD, parameter CDN8: RLP=2: Called Party Release
 - d. When the called party answers, billing information on the incoming call is not collected.
- (6) When a collect call is terminated via CCIS line, whether to allow or restrict the collect call is determined at the tandem office. However, the kind of Collect Call Blocking signal is determined at the terminating office (ASYD, SYS1, INDEX 400, Bit 0).
- (7) This feature does not allow collect calls (GII=8) through tandem connections (including tandem connections via Call Forwarding –All Calls/Busy/Logout).

4. PROGRAMMING

- STEP 1: ASYD - System Data 1, Index 400, Bit 0. 0/1 = Collect Call is restricted by sending Collect Call Blocking signal in a signaling sequence/when the called station answers. System Data 3, Index 7. Assign Ringer Pattern used for collect calls.
- STEP 2: ARTI - When System Data 1, Index 400, bit 0 is assigned as “0”, assign the following route data for the C.O. line.
 CDN56: CLBK (Kind of Collect Call Blocking Signal)
 0/1 = GB-7/GB-3
- STEP 3: ASFC - Assign SFI 20 (Collect Call Blocking) to the station allowed this service.

5. INTERACTIONS

- (1) “COLECT/CLCT” indication is not displayed on the Desktop terminal LCD when:
- the collect call is terminated via CALL FORWARDING - ALL CALLS [C-5]/BUSY LINE [C-2]/DON’T ANSWER [C-3].
 - the collect call is a UCD incoming call.
- (2) When a collect call is transferred to a Desktop terminal via CALL FORWARDING - DON’T ANSWER [C-3], “CLCT” indication and ringer pattern for collect calls are not effective.

- (3) When CALL FORWARDING - DON'T ANSWER - OUTSIDE [C-74] has been set to the called station, Collect Call Blocking signal is sent when the transferred party answers.
- (4) When a collect call is routed to an interoffice trunk using the following features, the call is terminated to the Attendant.
- CALL FORWARDING - ALL CALLS - OUTSIDE [C-28]
 - CALL FORWARDING - BUSY LINE - OUTSIDE [C-60]
 - Tandem Connection (including outgoing calls via REMOTE ACCESS TO SYSTEM [R-2])
- (5) When a collect call is routed to an announcement trunk via DELAY ANNOUNCEMENT - UCD [D-31]/ DELAY ANNOUNCEMENT - ATTENDANT [D-114], the system returns Collect Call Blocking signal.

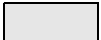
Contents of MFC Signaling for BRAZIL

BRAZIL				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP I	GROUP II Note 1	GROUP-A	GROUP-B
1	Digit "1"	Ordinary Subscriber	Send Next Digit (N+1)	Called Party Idle
2	Digit "2"	Subscriber with Special Charging	—	Called Party Busy
3	Digit "3"	Maintenance Equipment	Address Complete, Changeover to Reception of G-II	Changed Number COLLECT CALL BLOCKING
4	Digit "4"	Local Public Call Box	Congestion	Congestion
5	Digit "5"	Operator	Send Category of Calling Subscriber	Called Party Idle without Charging
6	Digit "6"	Data Transmission	—	Called Party Idle with Charge: Called Party Release
7	Digit "7"	National Public Call Box Ordinary Subscriber (International Working)	Send Last but Two Digits (N-2)	Unallocated Number COLLECT CALL BLOCKING
8	Digit "8"	Data Transmission (International Working) COLLECT CALL	Send Last but Three Digits (N-3)	—
9	Digit "9"	Subscriber with Priority (International Working)	Send Last but One Digit (N-1)	—
10	Digit "0"	Operator with Forward Transfer Facility (International Working)	—	—
11	Digit "*"	Call Transfer	—	—
12	Digit "#"	—	—	—

Contents of MFC Signaling for BRAZIL

BRAZIL				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP I	GROUP II Note 1	GROUP-A	GROUP-B
13	—	—	—	—
14	—	—	—	—
15	End of Pulsing	—	—	—

 : Signals transmitted and received

 : Signals received

Note 1: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

3.5 CHILE

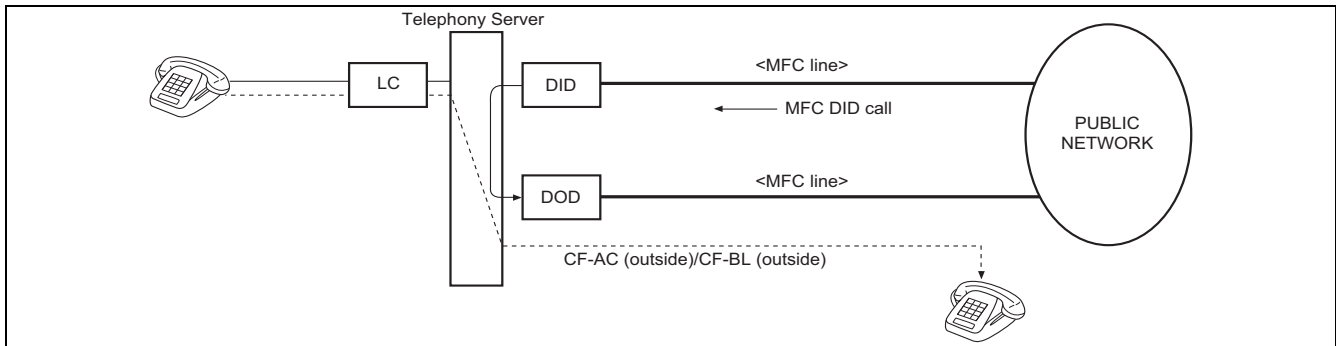
The table "Contents of MFC Signaling for CHILE" shows the meanings of the forward signal and backward signal.

3.5.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as "LCR" or "LCRS" in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal with MODEM POOLING.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk
 - Station by Individual Trunk Access
 - Tandem connection
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk Access
 - Attendant Console with a held station
 - Attendant Console with a held trunk

- (5) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
- (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
- (6) A station user can transfer a DID call from/to MFC line by above services.

**CALL FORWARDING-ALL CALLS-OUTSIDE/CALL FORWARDING-BUSY
LINE-OUTSIDE (MFC to MFC)**



- (7) The following service features are available for MFC outgoing calls.
- CALL HOLD
 - CALL FORWARDING-ALL CALLS
 - CALL FORWARDING-ALL CALLS-OUTSIDE
 - CALL FORWARDING-BUSY LINE
 - CALL FORWARDING-BUSY LINE-OUTSIDE
 - INCOMING CENTRAL OFFICE CALL TO TIE LINE CONNECTION
 - INDIVIDUAL TRUNK ACCESS (from ATT)
 - LAST NUMBER CALL
 - LEAST-COST ROUTING - 3/6-DIGIT
 - OUTGOING TRUNK QUEUING (STA Ring Back Queuing, STA Hold on Queuing, TANDEM Hold on Queuing)
 - PEG COUNT
 - RESTRICTION FROM OUTGOING CALL
 - SPEED CALLING
 - STATION MESSAGE DETAIL RECORDING (SMDR)
 - TOLL DENIAL/TOLL DIVERSION
 - TOLL RESTRICTION - 3/6-DIGIT
 - TRUNK TO TRUNK CONNECTION

- (8) Even if an originating office receives Group-II signal “B1 (= Change Calling Party Release)” from a terminating office, release of MFC trunks conforms to Route Data (Calling Party Release/Called Party Release) of the originating office.
- (9) On receipt of “Send Next Digit (N+1)” <Group A-1> as a backward signal for the last digit of Group-I signal, the system sends out “End of Pulsing” <Group-I 15> or waits for a backward signal depending upon the following data programming.
- (a) ASYD, System Data 1, Index 126, bit 7=0 : “End of Pulsing” <Group-I 15> is sent out.
 - (b) ASYD, System Data 1, Index 126, bit 7=1 : “End of Pulsing” <Group-I 15> is not sent out. (waiting for a backward signal)
- (10) When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:
- G-II=1 Subscriber without Priority
 - G-II=2 Subscriber with Priority

When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.

- “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.5.2 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows.

<ANI Information> = <Class Information> + <Calling Number>

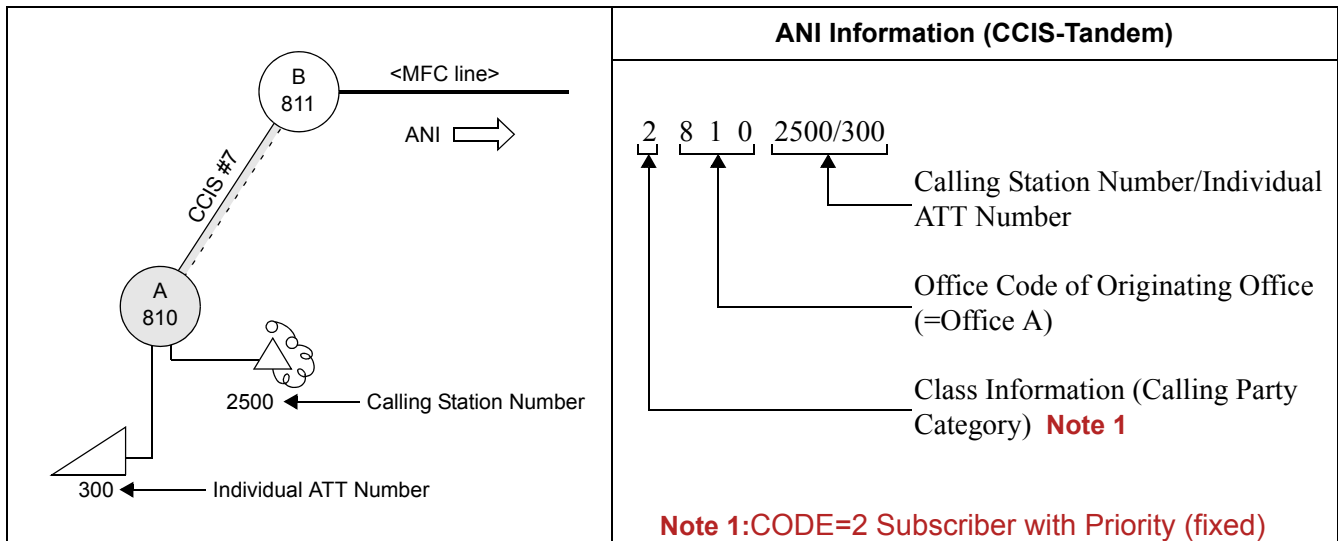
- (a) Class Information (1 digit): Signifies “Calling Party Category” which is transmitted as a Group-II Forward Signal. As the “Calling Party Category”, the following two types can be selected depending upon SFC (Service Feature Restriction Class).
 - Group-II CODE=1: Subscriber without Priority (can be designated by SFI 91=1)
 - Group-II CODE=2: Subscriber with Priority (can be designated by SFI 91=0)
 - (b) Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).
 - Station number of the calling party
 - Listed Directory Number which can be assigned in the AANI command on a TN basis
- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.
- (3) Depending upon data assignment in the AANI command, the following two alternatives are available.
- (a) When “*” or “#” is assigned at “LS” in the AANI command:

<ANI Information>	=	Calling Party Category <Class Information>	+	Station Number <Calling Number>
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- (b) When numerical information is assigned at “LS” in the AANI command:

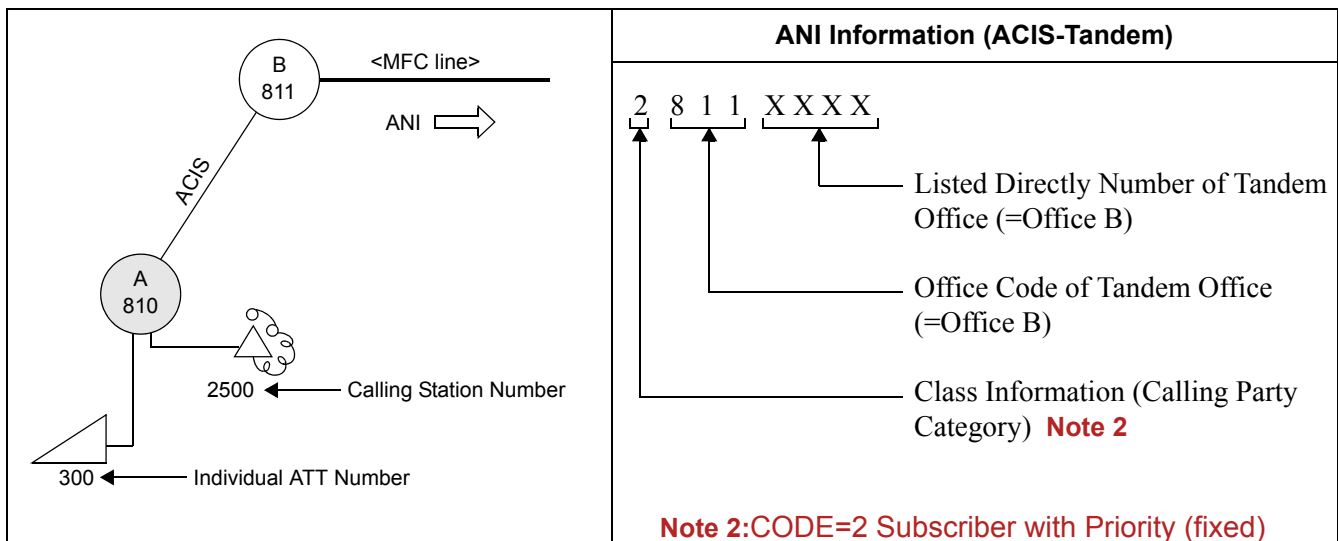
- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signalling No. 7).

CCIS-Tandem



- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signalling).

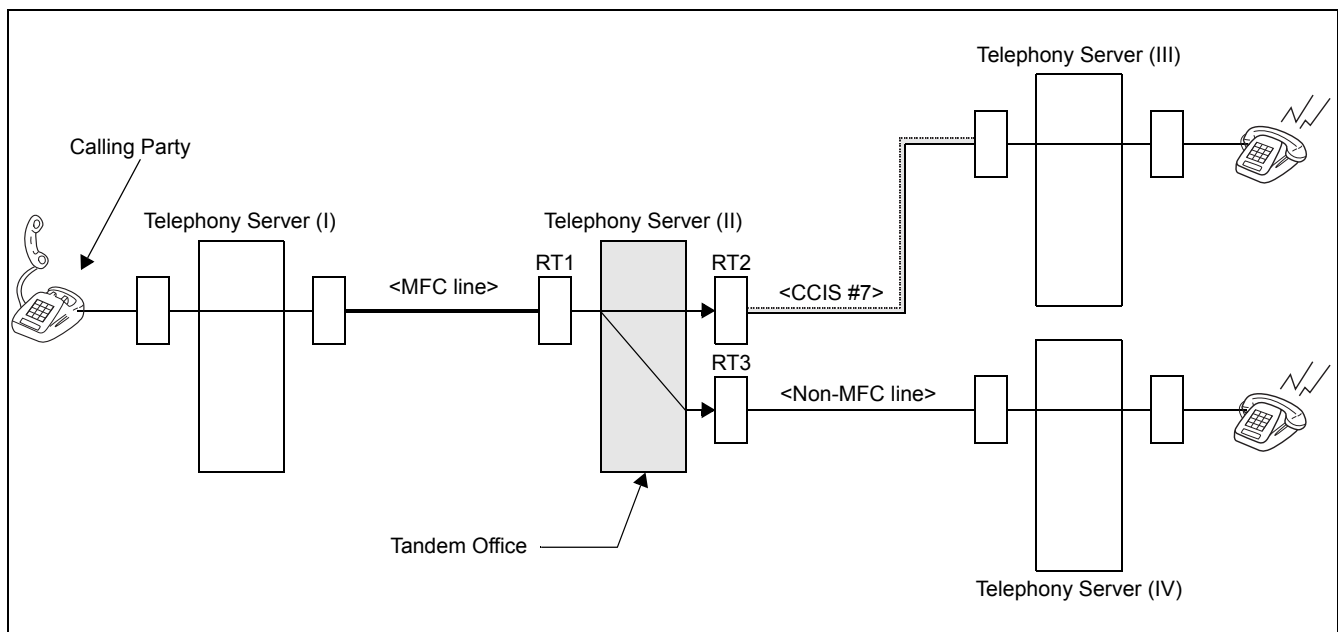
ACIS-Tandem



3.5.3 Service Conditions pertaining to MFC Incoming Call

- (1) A DID call can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (2) Call termination to DATA terminals and Service Modules are available by the DTX key operations on a Desktop terminal with MODEM POOLING.
- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).
- (4) Under the following tandem connection, from an MFC line to a CCIS #7/Non-MFC line, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 are assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to Non-MFC)



Note: In the figure above, when receiving Group-II signal (ARTD/ARTDN OC=1) or Called Party Number (ARTD/ARTDN OC=0), Telephony Server (II) allows or restricts the tandem connection (ARRC/ARRCN) between MFC and CCIS, then returns a backward signal (Group-B signal) to Telephony Server (I) regardless of status (idle, busy or restricted) of the called party accommodated in Telephony Server (III). Telephony Server (II) does not return a backward signal after receiving the status of the called party. For tandem connections from MFC line to lines other than CCIS, a relay office returns a backward signal with the same timing.

- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Called Party Idle” to the originating office, even if the TAS information has not been assigned in the ATAS command at the terminating office.
- (6) When a called party is idle, the incoming call is connected to the called party regardless of the received Group-II signal. This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.
- (7) Depending upon the called party status, the following codes are transmitted as Group-B signalling:

• Called party busy.....	G-B=3
• Congestion.....	G-B=4
• Dead Number	G-B=5
• Called party idle (charge).....	G-B=6
• LDN (ATT).....	G-B=6
• Intercept to ATT (called party is restricted)	G-B=6
• Call forwarding all calls to ATT.....	G-B=6
• Call forwarding busy line to ATT	G-B=6
• Night station	G-B=6
• TAS connection	G-B=6
• Tandem Connection.....	G-B=6
• Call Forwarding-Outside.....	G-B=6
• Called Party Idle (no charge).....	G-B=7
• Lockout/Make Busy	G-B=8
• Restriction	G-B=8
- (8) With regard to an MFC Incoming Call, the following service features are available:
 - CALL FORWARDING-ALL CALLS
 - CALL FORWARDING-BUSY LINE
 - CALL FORWARDING-DON'T ANSWER
 - CALL FORWARDING-ALL CALLS-OUTSIDE
 - CALL FORWARDING-BUSY LINE-OUTSIDE
 - CALL FORWARDING-OUTSIDE (from Night Station Call)
 - CALL FORWARDING Intercept to Station/ATT
 - CALL PICKUP
 - CALL QUEUING
 - CALL WAITING-TERMINATING
 - DISTINCTIVE RINGING
 - IMMEDIATE RINGING
 - INCOMING CALL IDENTIFICATION
 - MULTI NUMBERING
 - NIGHT CONNECTION
 - PEG COUNT
 - STATION HUNTING-CIRCULAR
 - STATION HUNTING-TERMINAL
 - STATION HUNTING-SECRETARIAL
 - TRUNK ANSWER FROM ANY STATION(TAS)

- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

Contents of MFC Signaling for CHILE

CHILE				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP I/III	GROUP II Note 1	GROUP-A	GROUP-B
1	Digit “1”	Subscriber without Priority	Send Next Digit (N+1)	—
2	Digit “2”	Subscriber with Priority	Send Last but One Digit (N-1)	~~Send Special Information Tone~~
3	Digit “3”	Maintenance Equipment	Address Complete, Changeover to Group-B Signal	Subscriber’s Line Busy
4	Digit “4”	Subscriber with Remote Billing	Congestion in the National Network	Congestion, Encountered after Changeover from G-A to G-B Signal
5	Digit “5”	Operator	Send Calling Subscriber Category	Unassigned Number
6	Digit “6”	Data Transmission	Address Complete, with Charge	Unoccupied Subscriber’s Line with Billing (Charge)
7	Digit “7”	—	Send Last but Two Digits (N-2)	Unoccupied Subscriber’s Line without Billing (Without Charge)
8	Digit “8”	—	Send Last but Three Digits (N-3)	Subscriber’s Line Out of Order
9	Digit “9”	—	—	—
10	Digit “0”	—	—	—
11	Digit “*”	Unidentifiable Subscriber	—	—
12	Digit “#”	—	—	—
13	—	—	—	—
14	—	—	—	—
15	End of Pulsing	—	—	—

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

Note 1: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

3.6 COLOMBIA

The table "[Contents of MFC Signaling for COLOMBIA](#)" shows the meanings of the forward signal and backward signal.

3.6.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as "LCR" or "LCRS" in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal with MODEM POOLING.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk
 - Station by Individual Trunk Access
 - Tandem connection
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk Access
 - Attendant Console with a held station
 - Attendant Console with a held trunk
- (5) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
 - (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

- (10) When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:
- G-II=1 Subscriber without Priority
 - G-II=2 Subscriber with Priority

When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.

- “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.6.2 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows.

<ANI Information> = <Class Information> + <Calling Number>

- (a) Class Information (1 digit): Signifies “Calling Party Category” which is transmitted as a Group-II Forward Signal. As the “Calling Party Category”, the following two types can be selected depending upon SFC (Service Feature Restriction Class).
- Group-II CODE=1: Subscriber without Priority (can be designated by SFI 91=1)
 - Group-II CODE=2: Subscriber with Priority (can be designated by SFI 91=0)
- (b) Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).
- Station number of the calling party
 - Listed Directory Number which can be assigned in the AANI command on a TN basis
- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.
- (3) Depending upon data assignment in the AANI command, the following two alternatives are available.

- (a) When “*” or “#” is assigned at “LS” in the AANI command:

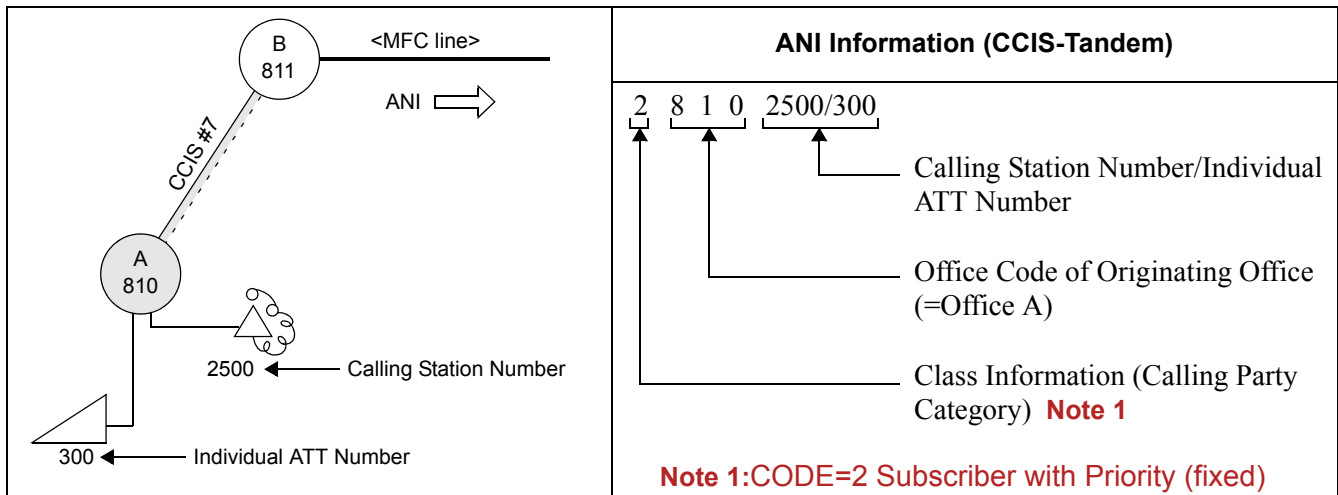
<ANI Information>	=	Calling Party Category	+	Station Number
		<Class Information>		<Calling Number>

- (b) When numerical information is assigned at “LS” in the AANI command:

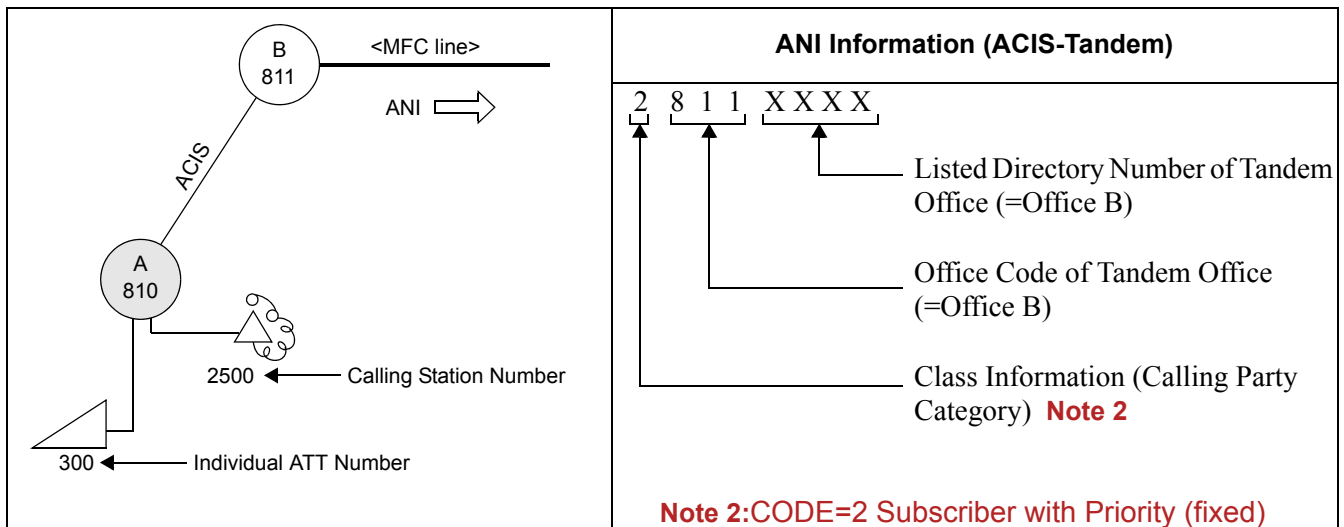
<ANI Information>	=	Calling Party Category	+	Office Code	Station Number
		<Class Information>		<Calling Number>	

- (4) As the Calling Number, only numerical information (0 ~ 9) is used. “*” and “#” can not be transmitted.
- (5) When Tandem Connection is involved, the transmitted ANI information is comprised as shown on the next page depending upon the Interoffice Signalling type (CCIS/ACIS).

- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7).

CCIS-Tandem

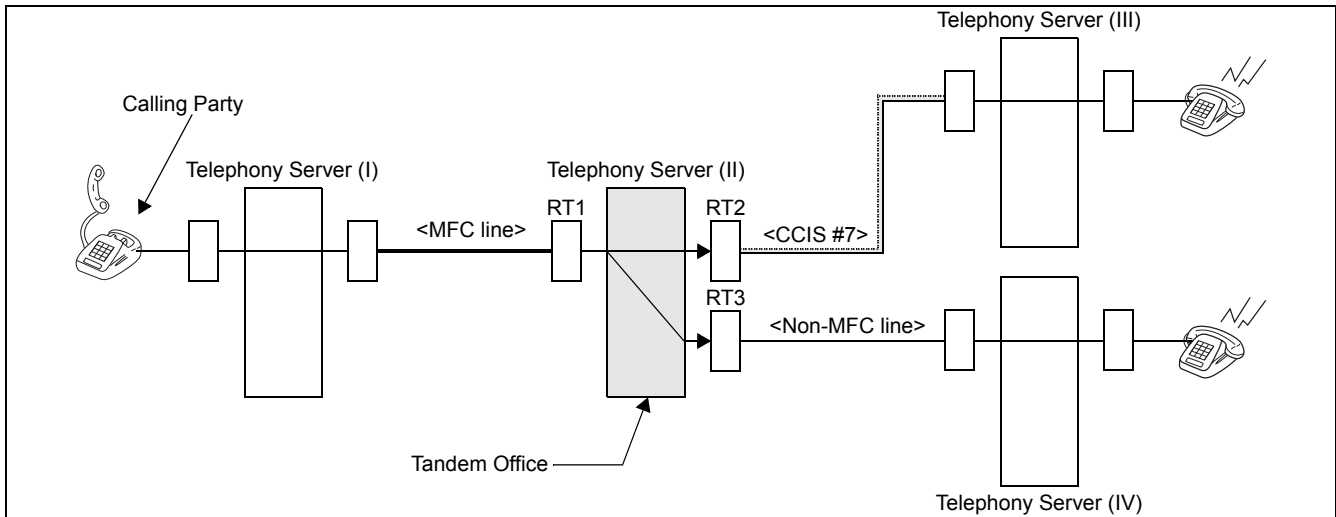
- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

ACIS-Tandem**3.6.3 Service Conditions pertaining to MFC Incoming Call**

- (1) A DID call can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (2) Call termination to DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal with MODEM POOLING.

- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).
- (4) Under the following tandem connection, from a MFC line to a CCIS #7/Non-MFC line, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 are assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to Non-MFC)



Note: In the figure above, when receiving Group-II signal (ARTD/ARTDN OC=1) or Called Party Number (ARTD/ARTDN OC=0), Telephony Server (II) allows or restricts the tandem connection (ARRC/ARRCN) between MFC and CCIS, then returns a backward signal (Group-B signal) to Telephony Server (I) regardless of status (idle, busy or restricted) of the called party accommodated in Telephony Server (III). Telephony Server (II) does not return a backward signal after receiving the status of the called party. For tandem connections from MFC line to lines other than CCIS, a relay office returns a backward signal with the same timing.

- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Called Party Idle” to the originating office, even if the TAS information has not been assigned in the ATAS command at the terminating office.
- (6) When a called party is idle, the incoming call is connected to the called party regardless of the received Group-II signal. This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.

(7) Depending upon the called party status, the following code is transmitted as Group-B signalling:

• Called party busy.....	G-B=3
• Congestion.....	G-B=4
• Dead Number	G-B=5
• Called party idle (charge)	G-B=6
• LDN (ATT).....	G-B=6
• Intercept to ATT (called party is restricted)	G-B=6
• Call forwarding all calls to ATT.....	G-B=6
• Call forwarding busy line to ATT	G-B=6
• Night station	G-B=6
• TAS connection	G-B=6
• Tandem Connection.....	G-B=6
• Call Forwarding-Outside.....	G-B=6
• Called Party Idle (no charge).....	G-B=7
• Lockout/Make Busy	G-B=8
• Restriction	G-B=8

(8) With regard to an MFC Incoming Call, the following service features are available:

- CALL FORWARDING-ALL CALLS
- CALL FORWARDING-BUSY LINE
- CALL FORWARDING-DON'T ANSWER
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- CALL FORWARDING-OUTSIDE (from Night Station Call)
- CALL FORWARDING INTERCEPT TO STATION/ATT
- CALL PICKUP
- CALL QUEUEING
- CALL WAITING-TERMINATING
- DISTINCTIVE RINGING
- IMMEDIATE RINGING
- INCOMING CALL IDENTIFICATION
- MULTI NUMBERING
- NIGHT CONNECTION
- PEG COUNT
- STATION HUNTING-CIRCULAR
- STATION HUNTING-TERMINAL
- STATION HUNTING-SECRETARIAL
- TRUNK ANSWER FROM ANY STATION(TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

Contents of MFC Signaling for COLOMBIA

COLOMBIA				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP I	GROUP II Note 1	GROUP-A	GROUP-B
1	Digit “1”	Subscriber	Send Next Digit (N+1)	~~Put Connection under Control of Incoming Side~~
2	Digit “2”	Calling Party with Priority	Send Last but One Digit (N-1)	~~Changed Number (Called Line Intercept)~~
3	Digit “3”	Maintenance Equipment	Send Nature of Caller and Change to Group-B Signal	Called Subscriber’s Line Busy
4	Digit “4”	—	Congestion	Congestion
5	Digit “5”	Operator	Send Nature (and Identity) of Caller	Dead Line or Dead Level
6	Digit “6”	Data Transmission	Trough Connect Speech Path	Called Subscriber’s Line Free with Metering (Charge)
7	Digit “7”	Subscriber for International Service	Send Last Digit but Two (N-2)	Called Subscriber’s Line Free without Metering (without Charge)
8	Digit “8”	—	Send Last Digit but Three (N-3)	Called Line Out of Order
9	Digit “9”	—	~~Nationally at Disposal~~	—
10	Digit “0”	Operator for International Service	~~Nationally at Disposal~~	—
11	Digit “*”	—	~~Send First Digit of International Code~~	—
12	Digit “#”	—	~~Send First Digit of Significant Number~~	—
13	~~Access to Maintenance Equipment for National Service~~	—	~~Send First Digit of International Code of Outgoing Country~~	—
14	~~Insert Echo-Suppressor~~	—	~~Inquiry whether Echo-Suppressor should be inserted or not~~	—
15	End of Pulsing	—	—	—

Contents of MFC Signaling for COLOMBIA

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

Note 1: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

3.7 INDIA

The table "[Contents of MFC Signaling for INDIA](#)" shows the meanings of the forward signal and backward signal.

3.7.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as "LCR" or "LCRS" in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal or MODEM POOLING with operator assistance.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk
 - Station by Individual Trunk Access
 - Station Hold on Queuing
 - Tandem connection
 - Hotline-Outside
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk Access
 - Attendant Console with a held station
 - Attendant Console with a held trunk
 - Attendant Hold on Queuing
 - Call Forwarding-Don't Answer-Outside
- (5) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
 - (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

- (6) The following service features are available for MFC outgoing calls.
- CALL HOLD
 - CALL FORWARDING-ALL CALLS
 - CALL FORWARDING-ALL CALLS-OUTSIDE
 - CALL FORWARDING-BUSY LINE
 - CALL FORWARDING-BUSY LINE-OUTSIDE
 - INCOMING CENTRAL OFFICE CALL TO TIE LINE CONNECTION
 - INDIVIDUAL TRUNK ACCESS (from ATT/Station)
 - LAST NUMBER CALL
 - LEAST-COST ROUTING - 3/6-DIGIT
 - OUTGOING TRUNK QUEUING (STA Ring Back Queuing, STA Hold on Queuing, TANDEM Hold on Queuing)
 - PEG COUNT
 - RESTRICTION FROM OUTGOING CALL
 - SPEED CALLING
 - STATION MESSAGE DETAIL RECORDING (SMDR)
 - TOLL DENIAL/TOLL DIVERSION
 - TOLL RESTRICTION - 3/6-DIGIT
 - TRUNK TO TRUNK CONNECTION
- (7) When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:
- G-II=1 Subscriber without Priority
 - G-II=2 Subscriber with Priority
- When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.
- (8) Release of MFC trunks conforms to Route Data (Calling Party Release/First Party Release) of the originating office.
- “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.7.2 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows.

<ANI Information> = <Calling Number>

Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).

- Station number of the calling party
 - Listed Directory Number which can be assigned in the AANI command on a TN basis
- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.

- (3) Depending upon data assignment in the AANI command, the following two alternatives are available.

- (a) When “*” or “#” is assigned at “LS” by the AANI command:

<ANI Information> =

Station Number
<Calling Number>

- (b) When numerical information is assigned at “LS” by the AANI command:

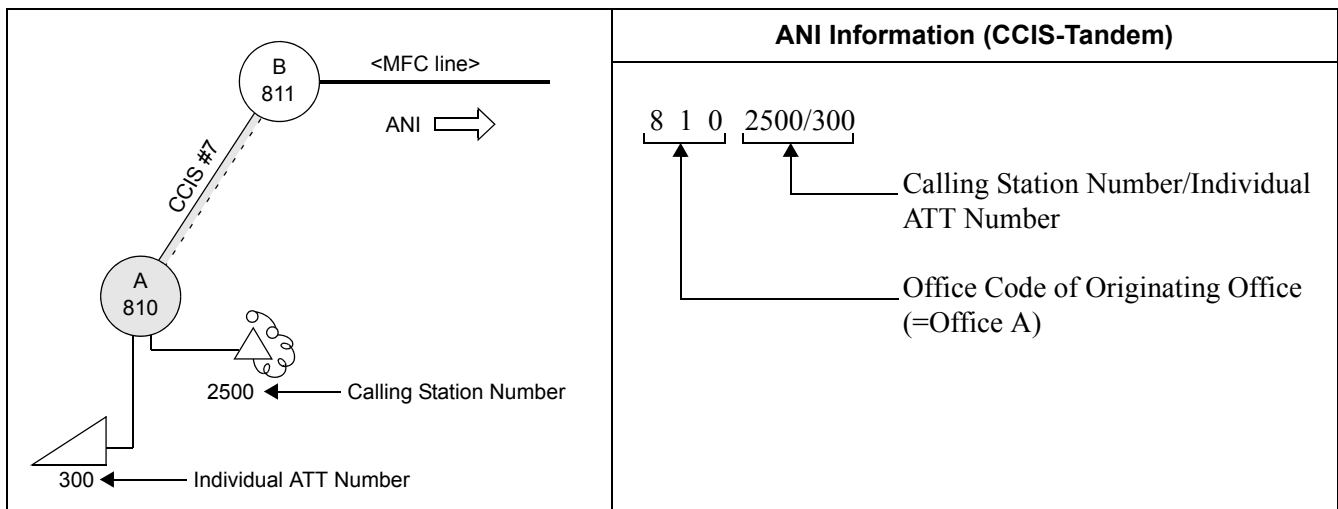
<ANI Information>	=	Office Code	Station Number
<Calling Number>			

- (4) As the Calling Number, only numerical information (0 ~ 9) is used. “*” and “#” can not be transmitted.

- (5) When Tandem Connection is involved, the transmitted ANI Information is comprised as shown below depending upon the Interoffice Signalling type (CCIS/ACIS).

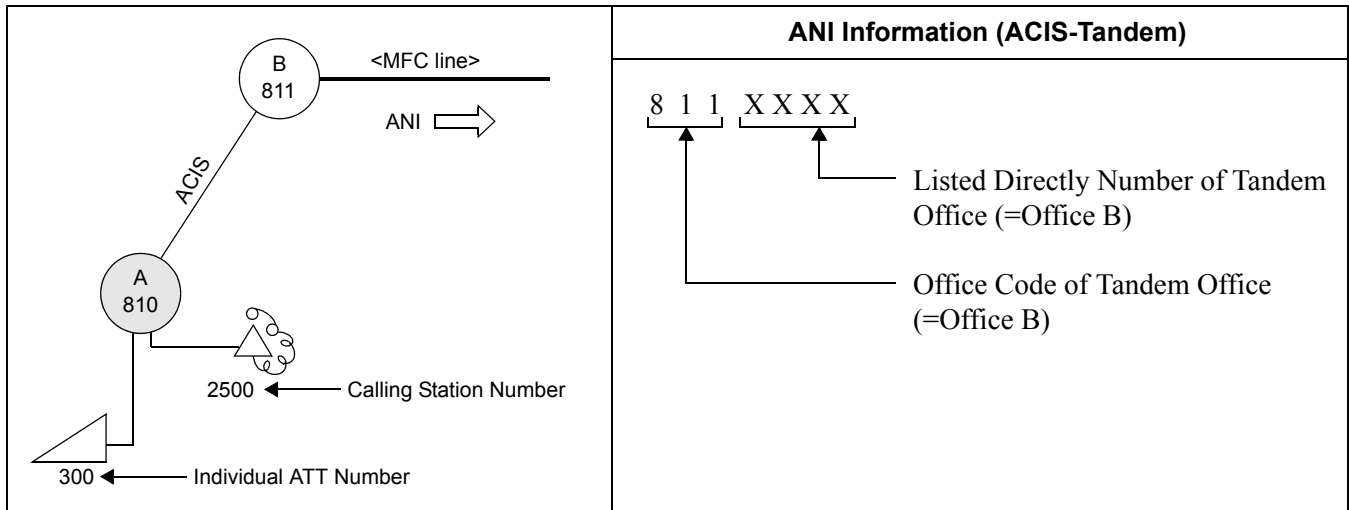
- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7).

CCIS-Tandem



- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

ACIS-Tandem



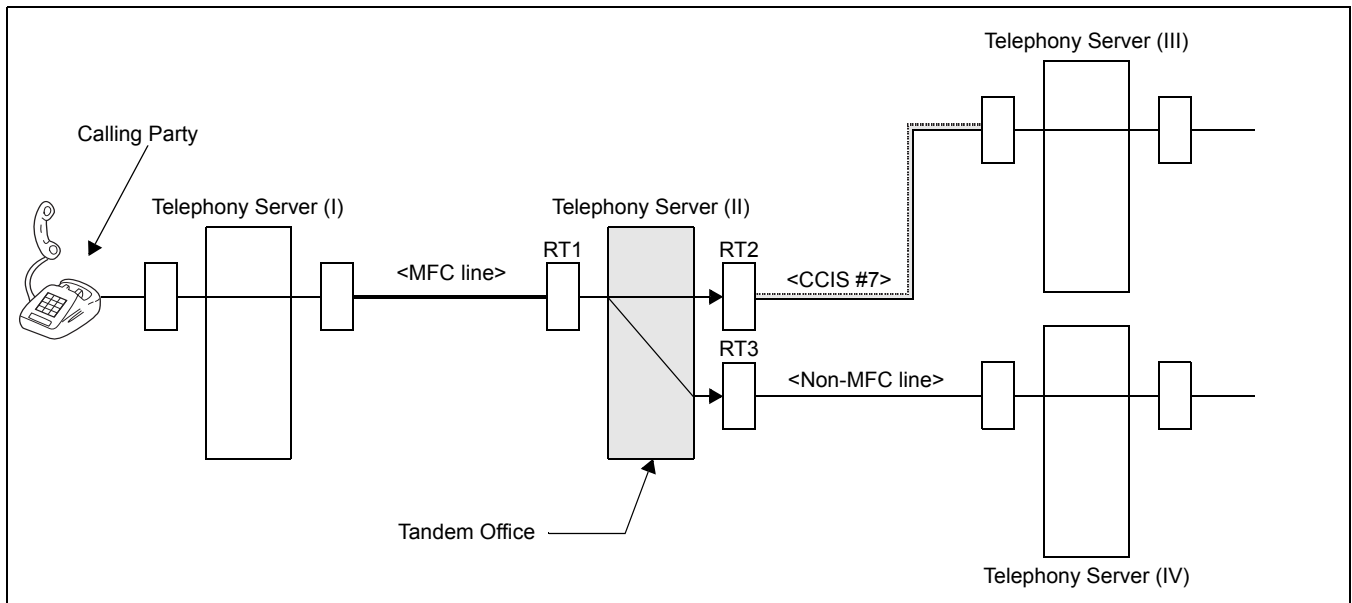
- (6) Whether ANI Information is available or not can be determined on a route basis according to the parameter ANI of ARTI command.
- (7) The system requests ANI information after receiving all the digits of G-I signal. The maximum number of digits for G-I signal is assigned by the parameter ANI of ARTI command.
- (8) The number of digits for ANI information (Max. 30) is assigned by AESC command.

3.7.3 Service Conditions pertaining to MFC Incoming Call

- (1) A DID call can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (2) Call termination to DATA terminals and Service Modules are available by the DTX key operations on a Desktop terminal or MODEM POOLING with operator assistance.
- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).

- (4) Under the following tandem connection (Next Page), from an MFC line to a CCIS #7/Non-MFC line, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 are assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to Non-MFC)



Note: In the figure above, when receiving Group-II signal (ARTD/ARTDN OC=1) or Called Party Number (ARTD/ARTDN OC=0), Telephony Server (II) allows or restricts the tandem connection (ARRC/ARRCN) between MFC and CCIS, then returns a backward signal (Group-B signal) to Telephony Server (I) regardless of status (idle, busy or restricted) of the called party accommodated in Telephony Server (III). Telephony Server (II) does not return a backward signal after receiving the status of the called party. For tandem connections from MFC line to lines other than CCIS, a relay office returns a backward signal with the same timing.

- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Normal Subscriber, Free, with Metering” to the originating office, even if the TAS information has not been assigned in the ATAS command at the terminating office.
- (6) When a called party is idle, the incoming call is connected to the called party regardless of the received Group-II signal. (This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.)
- (7) Release of MFC trunks conforms to Route Data (Calling Party Release/First Party Release) of the incoming route.
- (8) Called Number Display (Max. 16 digits) is available for ANI information.

(9) Depending upon the called party status, the following code is transmitted as Group-B signalling:

- Called party idle (charge), change calling party release G-B=6
- Called line busy G-B=3
- Congestion G-B=4
- Dead Number/Dead Level G-B=5
- Normal Subscriber, Free, with Metering G-B=6
- Intercept to ATT (called party is restricted) G-B=6
- CALL FORWARDING-ALL CALLS to ATT G-B=6
- CALL FORWARDING-BUSY LINE to ATT G-B=6
- NIGHT STATION G-B=6
- TAS CONNECTION G-B=6
- TANDEM CONNECTION G-B=6
- CALL FORWARDING-OUTSIDE G-B=6
- Lockout/Make Busy G-B=4
- Restriction G-B=4

(10) With regard to an MFC Incoming Call, the following service features are available:

- CALL FORWARDING-ALL CALLS
- CALL FORWARDING-BUSY LINE
- CALL FORWARDING-DON'T ANSWER
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- CALL FORWARDING-OUTSIDE (from Night Station Call)
- CALL FORWARDING INTERCEPT TO STN/ATT
- CALL PICKUP
- CALL QUEUING
- CALL WAITING-TERMINATING
- DISTINCTIVE RINGING
- IMMEDIATE RINGING
- INCOMING CALL IDENTIFICATION
- MULTI NUMBERING
- NIGHT CONNECTION
- PEG COUNT
- STATION HUNTING-CIRCULAR
- STATION HUNTING-TERMINAL
- STATION HUNTING-SECRETARIAL
- TRUNK ANSWER FROM ANY STATION (TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

Contents of MFC Signaling for INDIA

INDIA				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP-I	GROUP-II Note 1	GROUP-A	GROUP-B
1	Digit “1”	Ordinary Subscriber	Send Next Digit (N+1)	—
2	Digit “2”	Priority Subscriber	Restart	Changed Number
3	Digit “3”	—	Changeover to Reception of B-Signals	Called Line Busy
4	Digit “4”	—	Calling Line Identification	Congestion
5	Digit “5”	Operator	Send Category of Calling Subscriber	Unallocated Number
6	Digit “6”	—	Switch-through the Speech Path	Normal Subscriber, Free, with Metering
7	Digit “7”	—	Send Last but Two Digits (N-2)	Called Line Free, but Non - Metered
8	Digit “8”	—	Send Last but Three Digits (N-3)	—
9	Digit “9”	—	Send Last but One Digit (N-1)	—
10	Digit “0”	—	—	—
11	Digit “*”	—	—	—
12	Digit “#”	—	—	—
13	—	—	—	—
14	—	—	—	—
15	—	—	—	—

 : Signals transmitted and received

 : Signals received

Note 1: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

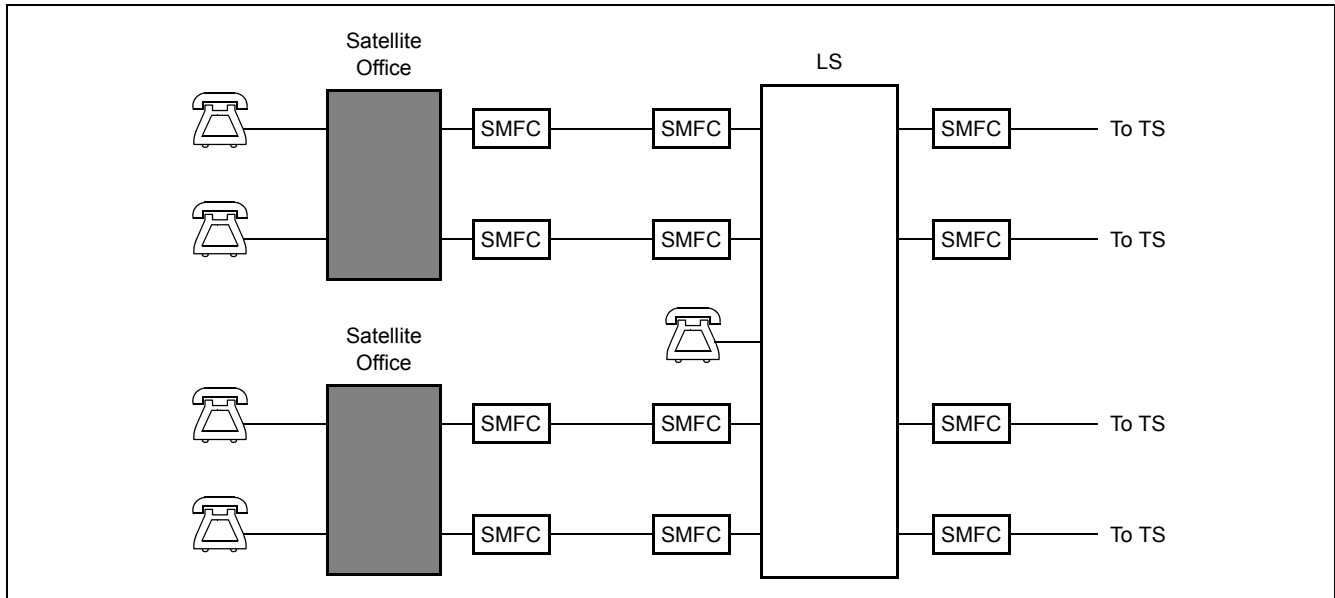
3.8 INDONESIA (SMFC)

The table “[Contents of MFC Signaling for INDONESIA](#)” shows the meanings of the forward signal and backward signal.

3.8.1 Service Conditions pertaining to MFC Outgoing Call

- (1) In Indonesian network, the system is used as Satellite Office of LS. In the conceptual diagram below, the system is in charge of shaded parts. Note that the system cannot be used as LS or TS.

Conceptual Diagram of Indonesian Network



- (2) The outgoing connection to the MFC line is available in the LCR and LCRS.
- (3) The terminals which can originate a DOD [D-9] call to the MFC line are stations (DP, PB, Desktop terminal).
- (4) Outgoing Connection to the MFC line is available from the states given below.
- Station (idle status)
- (5) For a DID [D-8] incoming call from the MFC line, CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]/CALL FORWARDING-BUSY LINE-OUTSIDE [C-60] to the MFC line is not available.
- (6) Outgoing Connection to the MFC line by HOT LINE-OUTSIDE [H-9]/CALL FORWARDING DON'T ANSWER-OUTSIDE [C-79] is not available.

- (7) For outgoing connection to the MFC line, the following service features are available.
- CALL HOLD [C-6]
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28] (Trunk to trunk connection not available)
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60] (Trunk to trunk connection not available)
 - INCOMING CENTRAL OFFICE CALL TO TIELINE CONNECTION [I-3]
 - LAST NUMBER CALL [L-6]
 - LEAST COST ROUTING-3/6 DIGIT [L-5]
 - PEG COUNT [P-7]
 - RESTRICTION FROM OUTGOING CALLS [R-4]
 - SPEED CALLING-SYSTEM[S-3]
 - SPEED CALLING-GROUP [S-23]
 - SPEED CALLING-STATION [S-21]
 - STATION MESSAGE DETAIL RECORDING [S-10]
 - TOLL DENIAL/TOLL DIVERSION [T-6]
 - TOLL RESTRICTION-3/6-DIGIT [T-7]
- (8) With the system the forward signal G-II is transmitted according to the calling party's SFC (Service Feature Restriction Class).
- “*” and “#” are available for the Group I (G-I) signal.
 - Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.
 - “*” and “#” can not be transmitted to outside as ANI.

3.8.2 Service Conditions pertaining to MFC Incoming Call

- (1) The terminals to which DID [D-8] calls can be terminated from the MFC line are stations (DP, PB, Desktop terminal), ATTENDANT CONSOLE [A-3].
- (2) For incoming call to the DTE from the MFC line, it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (3) When a Listed Directory Number (LDN) is received from the MFC line, calls are terminated to the ATTENDANT CONSOLE [A-3].
- (4) For TAS [T-8] connection, if TAS connection restriction (which is set by the “ACFR” command) is allowed, a backward signal indicating subscriber's line free is transmitted to the originating office even if the TAS Indicator is not assigned.

(5) For incoming connection of the MFC line, the following service features are available.

- CALL FORWARDING ALL CALLS
- CALL FORWARDING BUSY LINE
- CALL FORWARDING DON'T ANSWER
- CALL FORWARDING ALL CALLS (to outside is not available)
- CALL FORWARDING BUSY LINE (to outside is not available)
- CALL PICK UP
- CALL QUEUING
- CALL WAITING-TERMINATING
- DISTINCTIVE RINGING
- IMMEDIATE RINGING
- INCOMING CALL IDENTIFICATION
- MULTI NUMBERING
- NIGHT CONNECTION
- PEG COUNT
- STATION HUNTING-CIRCULAR
- STATION HUNTING-TERMINAL
- STATION HUNTING-SECRETARIAL
- TRUNK ANSWER FROM ANY STATION (TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

3.8.3 Service Conditions pertaining to Tandem Connection

Tandem connection is not available.

Contents of MFC Signaling for INDONESIA

INDONESIA					
CODE	FORWARD SIGNAL			BACKWARD SIGNAL	
	GROUP-I	GROUP-II	GROUP-III	GROUP-A	GROUP-B
1	Digit “1”	National Operator	Digit “1”	Send Next Digit (N+1)	Subscriber Line Free (Charge)
2	Digit “2”	Normal Subscriber	Digit “2”	Restart from Beginning	Subscriber Busy
3	Digit “3”	Local Payphone	Digit “3”	Address Complete Change to B Signal	~~Send Special Information Tone~~
4	Digit “4”	International Operator	Digit “4”	Congestion	—
5	Digit “5”	Long Distance Payphone	Digit “5”	Address Complete Set-up Speech Condition	Subscriber Line Free (No Charge)
6	Digit “6”	National Test & Maintenance Equipment	Digit “6”	Send Calling Party’s Category/Number	~~Malicious Call Tracing~~
7	Digit “7”	International Test Equipment	Digit “7”	—	Unallocated National Number
8	Digit “8”	Cross Border Operator	Digit “8”	Restart with Last Digit but 1 (N-1)	Line Out of Service
9	Digit “9”	International Payphone	Digit “9”	Restart with Last Digit but 2 (N-2)	—
10	Digit “0”	—	Digit “0”	—	—
11	Digit “*”	—	—	—	—
12	Digit “#”	—	—	—	—
13	—	—	—	—	—
14	—	—	—	—	—
15	End of Available Information	—	End of Available Information	—	—

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

3.9 KOREA (KTA)

The table “Contents of MFC Signaling for KOREA (KTA)” shows the meanings of the forward signal and backward signal.

3.9.1 Service Conditions pertaining to MFC Outgoing Call

- (1) The outgoing connection to the MFC line is available in the LCR or LCRS.
- (2) The terminals which can originate a DOD call to the MFC line are stations (DP, PB, Desktop terminal) and ATTCON.
- (3) When originating a call to the MFC line from Data Terminal Equipment (DTE), it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (4) Outgoing connection to the MFC line is available from the status given below.

• Station (idle status) • Station which places a station in hold • Station which places a trunk in hold (tandem via station) • Tandem Connection • ATTCON (idle status) • INDIVIDUAL TRUNK ACCESS from ATTCON • ATTCON which places a station in hold • ATTCON which places a trunk in hold	}	CALL HOLD
	}	CALL HOLD
- (5) The G-II (Calling Party Category) signal can be selected by ASFC command.
- (6) Regardless of reception of G-B signal “1” (charge calling party release) from a terminating office, release of MFC trunks conforms to Route Data (Calling Party Release/Called Party Release) of the originating office.
- (7) The G-II (Calling Party Category) can be selected in the ASFC (SFI=91) command.
- (8) The system sent “End of Digit” (15) when the system received A-1 for the backward signal of the last digit on G-I.
 - “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.9.2 Service Conditions pertaining to MFC Incoming Call

- (1) The terminals to which DID calls can be terminated from the MFC line are stations (DP, PB, Desktop terminal) and ATTCON.
- (2) For incoming call to the DTE from the MFC line, it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (3) When Listed Directory Number (LDN) is received from the MFC line, calls are terminated to the ATTCON.

- (4) When calls have terminated to the UCD [U-1] group from the MFC line and all the stations in the group are busy, UCD Queuing is available.
- (5) For TAS [T-8] connection, if TAS connection is allowed (ACFR), a backward signal indicating subscriber's line free is transmitted to the originating office even if the TAS Indicator is not assigned.
- (6) When a called party is idle, system sends the backward signal under the following conditions.
 - (a) G-II has not received and ARTD, parameter CDN24: OC=0 G-A=6
 - (b) G-II has received and ARTD, parameter CDN24: OC=1 G-B=6

The call is terminated to the called party dialed irrespective of the forward signal G-II.

- (7) Depending on the status of the called party, the backward signal G-B will be either of the following:
 - Called party idle (charge) change called party release..... G-B=1
 - Called party busy..... G-B=3
 - Congestion..... G-B=4
 - Dead number G-B=5
 - Called party idle (charge) G-B=6
 - LDN (ATT)..... G-B=6
 - Intercept to ATT (called party REST) G-B=6
 - Call forwarding all calls to ATT..... G-B=6
 - Call forwarding busy line to ATT G-B=6
 - Night station G-B=6
 - Call forwarding to outside..... G-B=6
 - TAS connection G-B=6
 - Tandem connection G-B=6
 - Called party idle (no charge)..... G-B=7
 - Lock out/Make busy..... G-B=8
 - Restriction G-B=8

3.9.3 Service Conditions pertaining to Tandem Connection

- (1) The following tandem connections are available for KOREA.

Incoming Trunk	Outgoing Trunk	Tandem Connection
MFC	Other than MFC	Available
Other than MFC	MFC	Available
MFC	MFC	Available

- (2) The outgoing connection to the MFC line is available in the LCR or LCRS.
- (3) The tandem connection can be established when the called party sets the following CALL FORWARDING features.
- (a) MFC Incoming Trunk - Other than MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming Trunk - MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming Trunk - MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
- (4) OUTGOING TRUNK QUEUING is not available when the outgoing trunks are all busy at the tandem office. (Incoming trunks are MFC)
- (5) Depending on the status of the called party, the backward signal G-B will be either of the following.
- Intercept to ATTCON (Called Party Restriction) G-B=6
 - Tandem Connection G-B=6
 - Call Forwarding to Outside G-B=6
 - Dead Number G-B=5
 - Congestion G-B=4
 - Restriction G-B=8
- (6) The MFC signal link is established between the end offices when MFC-MFC tandem connection.
- (7) The following service features are not available at the call originating office when MFC-MFC tandem connection.
- SPEED CALLING-SYSTEM [S-3]
 SPEED CALLING-STATION [S-21]
 SPEED CALLING-GROUP [S-23]

- (8) With the system the forward signal G-II is fixed at “2” (Subscriber with priority) when tandem connection with the “Other than MFC Incoming trunk” and “MFC Outgoing trunk”.

When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:

- G-II=1 Subscriber without Priority
- G-II=2 Subscriber with Priority

When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.

Contents of MFC Signaling for KOREA (KTA)

KOREA (KTA)				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	G-I	G-II Note 1	G-A	G-B
1	Digit “1”	Subscriber without Priority	Send Next Digit (N+1)	Subscriber’s Line Free (Called Party Release)
2	Digit “2”	Subscriber with Priority	Send Last but One Digit (N-1)	~~Subscriber Number Change~~
3	Digit “3”	Line Test	Address Complete, Changeover to Reception of Group B	Subscriber’s Line Busy
4	Digit “4”	Coin Box	Congestion in the National Network	Congestion, Encountered after Changeover from Group A Signal to Group B Signal
5	Digit “5”	Operator	Send Calling Party Class	Unallocated Number
6	Digit “6”	Data Transmission	Address Complete, Change Set Up Speech Condition	Subscriber’s Line Free (Charge)
7	Digit “7”	International Call	Send Last but Two Digits (N-2)	Subscriber’s Line Free (No Charge)
8	Digit “8”	International Call	Send Last but Three Digits (N-3)	Subscriber’s Line Out of Order or Restrict
9	Digit “9”	International Call	Send First Digit of Called Number	—
10	Digit “0”	International Call Transfer Facility	—	—
11	Digit “*”	—	—	—
12	Digit “#”	—	—	—
15	End of Originating Subscriber’s	—	—	—

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

Note 1: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

3.10 MEXICO

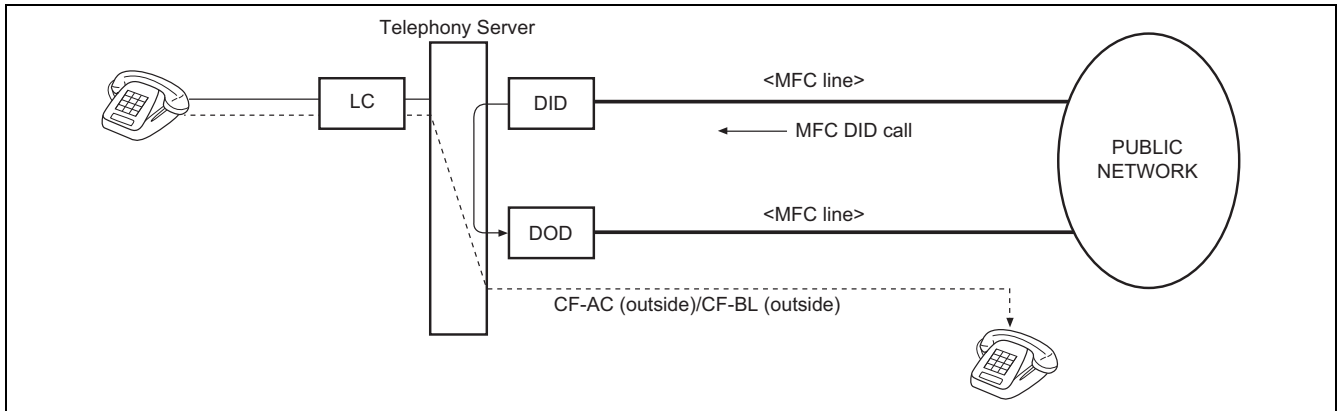
The table "[Contents of MFC Signaling for MEXICO](#)" shows the meanings of the forward signal and backward signal.

3.10.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as "LCR" or "LCRS" in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal with MODEM POOLING.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk
 - INDIVIDUAL TRUNK ACCESS from a station
 - Tandem connection
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk Access
 - Attendant Console with a held station
 - Attendant Console with a held trunk
- (5) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
 - (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

- (6) A station user cannot transfer a DID call (via an MFC line) to another MFC line by activating CALL FORWARDING-ALL CALLS-OUTSIDE or CALL FORWARDING-BUSY LINE-OUTSIDE. See below.

**CALL FORWARDING-ALL CALLS-OUTSIDE/CALL FORWARDING-BUSY
LINE-OUTSIDE (MFC to MFC)**



- (7) The following service features are available for MFC outgoing calls.
- CALL HOLD
 - CALL FORWARDING-ALL CALLS
 - CALL FORWARDING-ALL CALLS-OUTSIDE
 - CALL FORWARDING-BUSY LINE
 - CALL FORWARDING-BUSY LINE-OUTSIDE
 - INCOMING CENTRAL OFFICE CALL TO TIE LINE CONNECTION
 - INDIVIDUAL TRUNK ACCESS (from ATT)
 - LAST NUMBER CALL
 - LEAST-COST ROUTING - 3/6-DIGIT
 - OUTGOING TRUNK QUEUING (STA Ring Back Queuing, STA Hold on Queuing, TANDEM Hold on Queuing)
 - PEG COUNT
 - RESTRICTION FROM OUTGOING CALL
 - SPEED CALLING
 - STATION MESSAGE DETAIL RECORDING (SMDR)
 - TOLL DENIAL/TOLL DIVERSION
 - TOLL RESTRICTION - 3/6-DIGIT
 - TRUNK TO TRUNK CONNECTION
- (8) When an originating office receives “Send Next Digit (N+1)” <Group-A 1> as a backward signal from the terminating office, the originating office shall transmit “End of Digit” <Group-I 15>.
- “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.10.2 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows:

<ANI Information> = <Class Information> + <Calling Number>

- (a) Class Information (1 digit): Signifies “Calling Party Category” which is transmitted as a Group-II Forward Signal. As the “Calling Party Category”, the following two types can be selected depending upon SFC (Service Feature Restriction Class).
- Group-II CODE=1: Subscriber without Priority (can be designated by SFI 91=1)
 - Group-II CODE=2: Subscriber with Priority (can be designated by SFI 91=0)
- (b) Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).
- Station number of the calling party
 - Listed Directory Number which can be assigned in the AANI command on a TN basis

- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.

- (3) Depending upon data assignment in the AANI command, the following two alternatives are available.

- (a) When “*” or “#” is assigned at “LS” in the AANI command:

<ANI Information>	=	Calling Party Category	+	Station Number
		<Class Information>		<Calling Number>

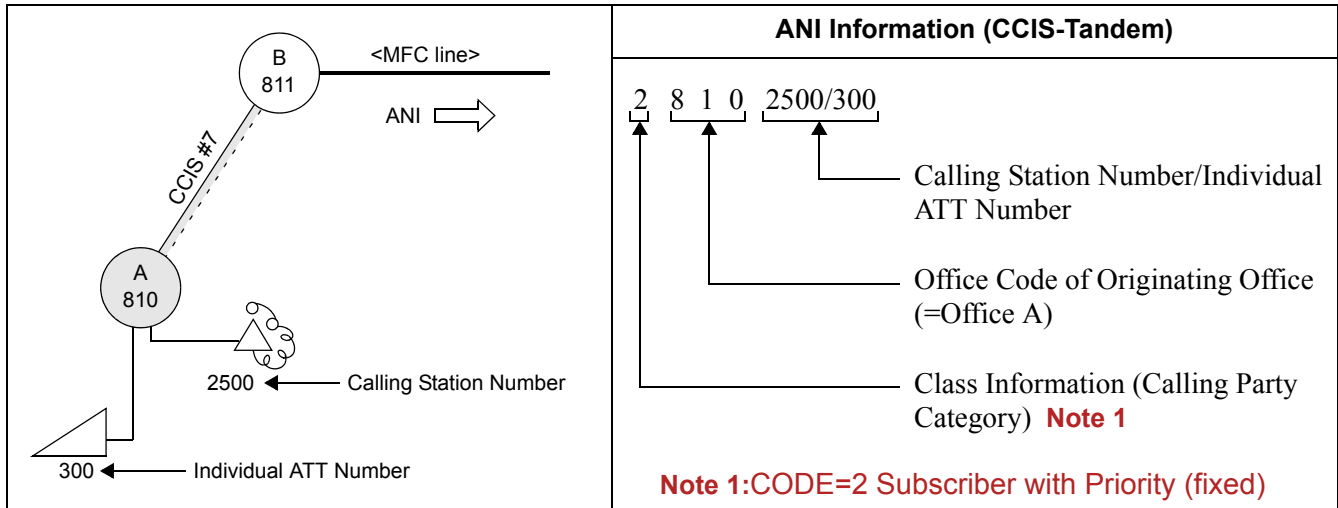
- (b) When numerical information is assigned at “LS” in the AANI command:

<ANI Information>	=	Calling Party Category	+	Office Code	Station Number
		<Class Information>		<Calling Number>	

- (4) As the Calling Number, only numerical information (0 ~ 9) is used. “*” and “#” can not be transmitted.

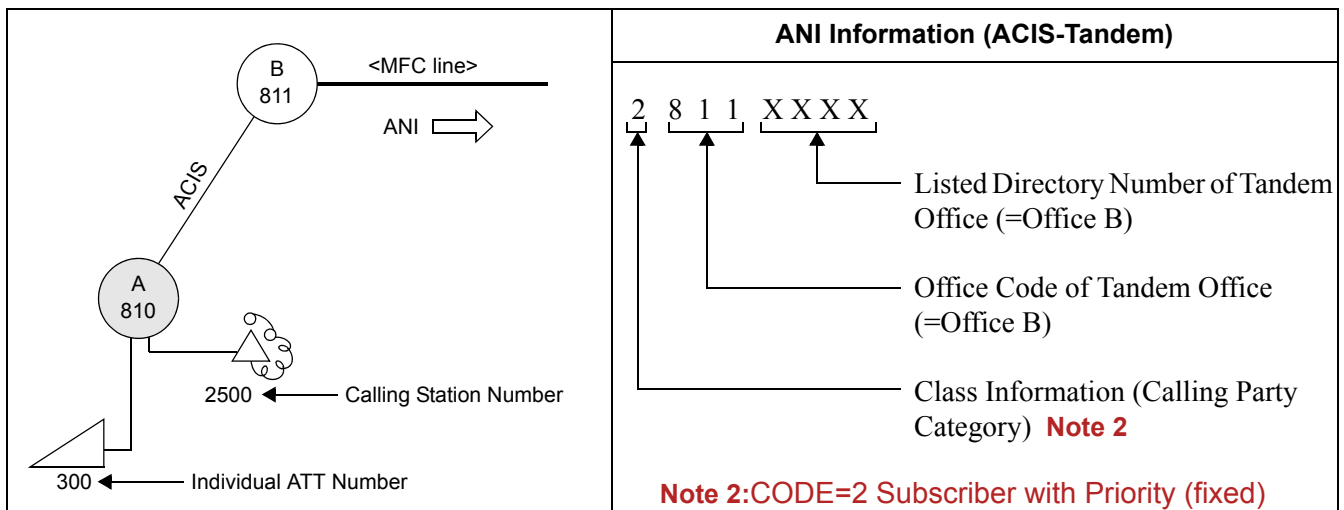
- (5) When Tandem Connection is involved, the transmitted ANI information is comprised as shown below depending upon the Interoffice Signalling type (CCIS/ACIS).
- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7). In this case, the ARNP/ASAT commands must be assigned.

CCIS-Tandem



- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

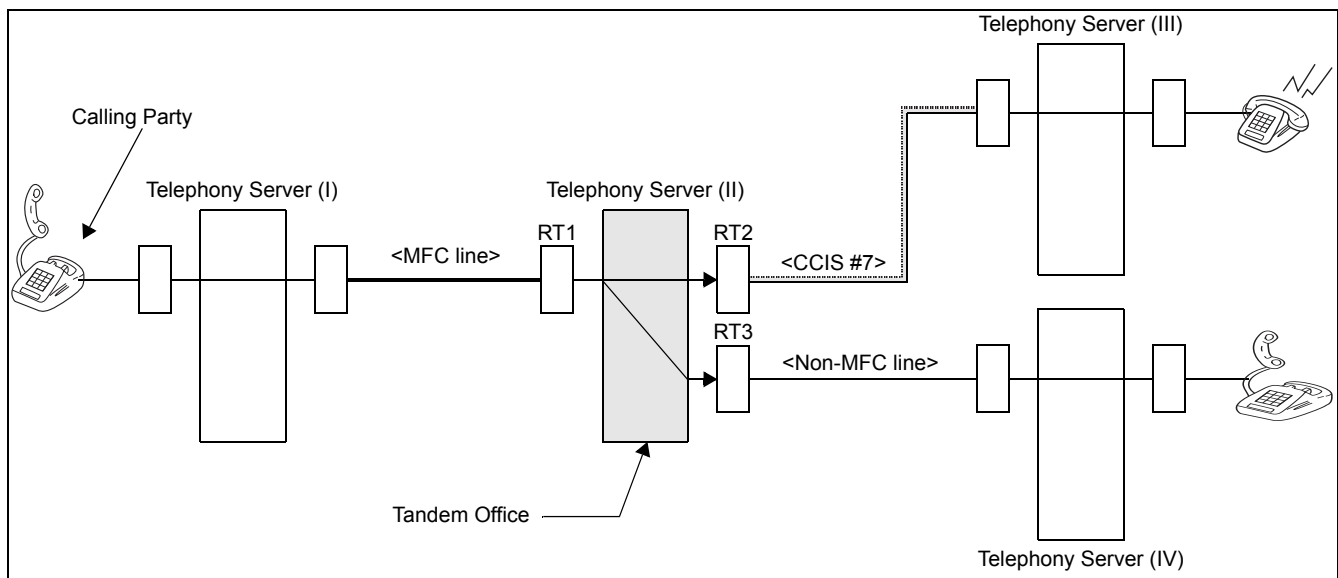
ACIS-Tandem



3.10.3 Service Conditions pertaining to MFC Incoming Call

- (1) A DID call can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (2) Call termination to DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal with MODEM POOLING.
- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).
- (4) Under the following tandem connection, from an MFC line to a CCIS #7/Non-MFC line, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 are assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to Non-MFC)



Note: In the figure above, when receiving Group-II signal (ARTD/ARTDN OC=1) or Called Party Number (ARTD/ARTDN OC=0), Telephony Server (II) allows or restricts the tandem connection (ARRC/ARRCN) between MFC and CCIS, then returns a backward signal (Group-B signal) to Telephony Server (I) regardless of status (idle, busy or restricted) of the called party accommodated in Telephony Server (III). Telephony Server (II) does not return a backward signal after receiving the status of the called party. For tandem connections from MFC line to lines other than CCIS, a relay office returns a backward signal with the same timing.

- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Called Party Idle” to the originating office, even if the TAS information has not been assigned in the ATAS command at the terminating office.

-
- (6) When a called party is idle, the incoming call is connected to the called party regardless of the received Group-II signal. (This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.)
- (7) Depending upon the called party status, the following code is transmitted as Group-B signalling:
- Called party idle (charge), change calling party release G-B=1
 - Called party busy..... G-B=2
 - Congestion..... G-B=4
 - Dead Number G-B=4
 - Called party idle (charge) G-B=1
 - LDN (ATT)..... G-B=1
 - Intercept to ATT (called party is restricted) G-B=1
 - CALL FORWARDING-ALL CALLS to ATT G-B=1
 - CALL FORWARDING-BUSY LINE to ATT G-B=1
 - NIGHT STATION G-B=1
 - TAS CONNECTION..... G-B=1
 - TANDEM CONNECTION G-B=1
 - CALL FORWARDING-OUTSIDE..... G-B=1
 - Called Party Idle (no charge)..... G-B=5
 - Lockout/Make Busy G-B=4
 - Restriction G-B=4
- (8) With regard to an MFC Incoming Call, the following service features are available:
- CALL FORWARDING-ALL CALLS
 - CALL FORWARDING-BUSY LINE
 - CALL FORWARDING-DON'T ANSWER
 - CALL FORWARDING-ALL CALLS-OUTSIDE
 - CALL FORWARDING-BUSY LINE-OUTSIDE
 - CALL FORWARDING-OUTSIDE (from Night Station Call)
 - CALL FORWARDING INTERCEPT TO STATION/ATT
 - CALL PICKUP
 - CALL QUEUING
 - CALL WAITING-TERMINATING
 - DISTINCTIVE RINGING
 - IMMEDIATE RINGING
 - INCOMING CALL IDENTIFICATION
 - MULTI NUMBERING
 - NIGHT CONNECTION
 - PEG COUNT
 - STATION HUNTING-CIRCULAR
 - STATION HUNTING-TERMINAL
 - STATION HUNTING-SECRETARIAL
 - TRUNK ANSWER FROM ANY STATION(TAS)
 - TENANT SERVICE
 - UNIFORM CALL DISTRIBUTION
 - UNIFORM NUMBERING PLAN
 - REMOTE ACCESS TO SYSTEM
-

Contents of MFC Signaling for MEXICO

MEXICO						
CODE	FORWARD SIGNAL			BACKWARD SIGNAL		
	GROUP I	GROUP II	GROUP III	GROUP-A	GROUP-B	GROUP-C
1	Digit "1"	—	Digit "1"	Send Next Digit (N+1)	Subscribers with Charge	Send G-III Signal Next Digit
2	Digit "2"	Ordinary Subscriber	Digit "2"	Send Signal First Digit	Subscriber Line Busy	Send G-I Signal First Digit and Change Receipt Group-A
3	Digit "3"	Coin Box Telephone	Digit "3"	Send Group II Signal and Change to Reception of Group-B Signal	—	Send G-II Signal and Change Receipt Group-B
4	Digit "4"	Time and Cost	Digit "4"	Congestion	Line Lockout	Congestion
5	Digit "5"	—	Digit "5"	—	Subscriber Idle without Charge	Send G-I Signal Next Digit and Change Receipt Group-A
6	Digit "6"	Maintenance Equipment	Digit "6"	Send Group-II-6 and Change to Receipt of Group-C Signal	—	Send G-I Signal Same Digit and Change Digit Receipt Group-A
7	Digit "7"	Identification of the No. 2 Subscriber in Party Line	Digit "7"	—	—	—
8	Digit "8"	Identification of the No. 3 Subscriber in Party Line	Digit "8"	—	—	—
9	Digit "9"	Identification of the No. 1 Subscriber in Party Line	Digit "9"	—	—	—
10	Digit "0"	—	Digit "0"	—	—	—
11	Digit "*"	—	—	—	—	—
12	Digit "#"	—	—	—	—	—
15	—	—	End of Digit	—	—	—

 : Signals transmitted and received

 : Signals received

3.11 SINGAPORE (Telecom Specification)/MALAYSIA

In the Singapore/Malaysia system, DOD [D-9] to the MFC line is not used at present.

The table “Contents of MFC Signaling for SINGAPORE (Telecom Specification)/MALAYSIA” shows the meaning of the forward signal and backward signal.

3.11.1 Service Conditions pertaining to MFC Incoming Call

- (1) The terminals to which DID [D-8] calls can be terminated from the MFC line are stations (DP, PB, Desktop terminal) and ATTCON.
- (2) For incoming call to the DTE from the MFC line, it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (3) When a Listed Directory Number (LDN) is received from the MFC line, calls are terminated to the ATTENDANT CONSOLE [A-3].
- (4) For TAS [T-8] connection, if TAS connection restriction (which is set by the “ACFR” command) is allowed, a backward signal indicating subscriber’s line free is transmitted to the originating office even if the TAS Indicator is not assigned.
- (5) When a called party is idle, the call is terminated to the following terminal respecting G-II signal which is received from the originating office.
 - (a) G-II=“1” (Toll Operator) and ARTD, parameter CDN23: TR=0 ATTCON
 - (b) G-II=“7” (Line Test Disk) and ARTD, parameter CDN23: TR=0 ATTCON
 - (c) G-II=“8” (International Operator) and ARTD, parameter CDN23: TR=0 ATTCON
 - (d) G-II=“9” (Call from Transit Exchange) and ARTD, parameter CDN23: TR=0..... ATTCON

Note: ASYD, System Data 1, Index 70, Bit 0 (Called Number Display) 0/1 = Out of service/ In service
 - When this data is enabled and a call is forwarded to an ATTCON, the operating party's number is displayed on the ATTCON.
 - When this data is disabled, MFC incoming route/trunk number is displayed.

Note: DELAY ANNOUNCEMENT - ATTENDANT [D-114] is supported.

- (e) When the received G-II signal is other than above (a) ~ (d)..... The dialed Called Party

(6) Depending on the state of the called party, the backward signal G-B will be either of the following:

• Called party idle (charge)	G-B=1
• Called party idle (no charge)	G-B=1
• Called party idle (charge) change to called party release	G-B=1
• LDN (ATTCON)	G-B=1
• Intercept to ATTCON (Called party is restricted)	G-B=1
• Call Forwarding-All Calls to ATTCON	G-B=1
• Call Forwarding-Busy Line to ATTCON	G-B=1
• Night station (station to which calls terminated to the ATTENDANT CONSOLE [A-3] are forwarded in the night mode)	G-B=1
• TAS connection	G-B=1
• Tandem connection	G-B=1
• Call Forwarding-Outside	G-B=1
• Called party busy	G-B=2
• Lockout/Make Busy	G-B=4
• Congestion	G-B=4
• Restriction	G-B=4
• Dead number	G-B=7

(7) For incoming call from the MFC line, service features given below are available.

• CALL FORWARDING-BUSY LINE	[C-2]
• CALL FORWARDING-DON'T ANSWER	[C-3]
• CALL FORWARDING-ALL CALLS	[C-5]
• CALL FORWARDING-INTERCEPT/ANNOUNCEMENT	[C-25]
• CALL FORWARDING-OUTSIDE	[C-28]
• CALL PICKUP-GROUP	[C-7]
• CALL PICKUP-DIRECT	[C-30]
• CALL QUEUING	[C-9]
• CALL WAITING-TERMINATING	[C-12]
• DISTINCTIVE RINGING	[D-10]
• FLEXIBLE NUMBERING OF STATIONS	[F-1]
• IMMEDIATE RINGING	[I-1]
• INCOMING CALL IDENTIFICATION	[I-2]
• NIGHT CONNECTION-FIXED	[N-1]
• NIGHT CONNECTION-FLEXIBLE	[N-2]
• NIGHT CONNECTION SYSTEM-OUTSIDE	[N-17]
• PEG COUNT	[P-7]
• STATION HUNTING-CIRCULAR	[S-7]
• STATION HUNTING-SECRETARIAL	[S-8]
• STATION HUNTING-TERMINAL	[S-9]
• TRUNK ANSWER FROM ANY STATION (TAS)	[T-8]
• TENANT SERVICE	[T-12]
• UNIFORM CALL DISTRIBUTION	[U-1]
• “*” and “#” are available for the Group I (G-I) signal.	

3.11.2 Service Conditions pertaining to Tandem Connection

- (1) The tandem connection between MFC incoming trunk and the other trunks (other than MFC line) are available.
- (2) The tandem connection cannot be established even if the called party sets the following service features.
CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
- (3) When the outgoing call is restricted (Toll Diversion) at the tandem office, the call terminates to ATTCON.
- (4) When the outgoing call is restricted (Toll Denial) at the tandem office, the system sent G-B signal of Restriction to the originating office.
- (5) OUTGOING TRUNK QUEUING is not available when the outgoing trunks are all busy at the tandem office. (Incoming trunks are MFC lines.)
- (6) Depending on the status of the called party, the backward signal G-B will be either of the following.
 - Intercept to ATT CON (called party restriction) G-B=1
 - Tandem Connection..... G-B=1
 - Call Forwarding to Outside G-B=1
 - Dead Number G-B=7
 - Congestion..... G-B=4
 - Restriction G-B=4

Contents of MFC Signaling for SINGAPORE (Telecom Specification)/MALAYSIA

SINGAPORE				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP-I (G-I)	GROUP-II (G-II)	GROUP-A (G-A)	GROUP-B (G-B)
1	Digit “1”	Operator	Send Next Digit (N+1)	Called Subscriber’s Line Free
2	Digit “2”	Subscriber	—	Called Subscriber’s Line Busy
3	Digit “3”	Local Call	Address Complete, Changeover to Reception of G-B Signal	—
4	Digit “4”	—	Congestion	Congestion
5	Digit “5”	International Call	—	—
6	Digit “6”	Test Equipment	—	—
7	Digit “7”	Line Test Desk	—	Unallocated Number
8	Digit “8”	International Operator	—	—
9	Digit “9”	Call from Transit Ex- change	—	—
10	Digit “0”	—	—	—
11	Digit “*”	—	—	—
12	Digit “#”	—	—	—
13 14 15	—	—	—	—

 : Signals transmitted and received

 : Signals received

3.12 THAILAND (TOT Specification)

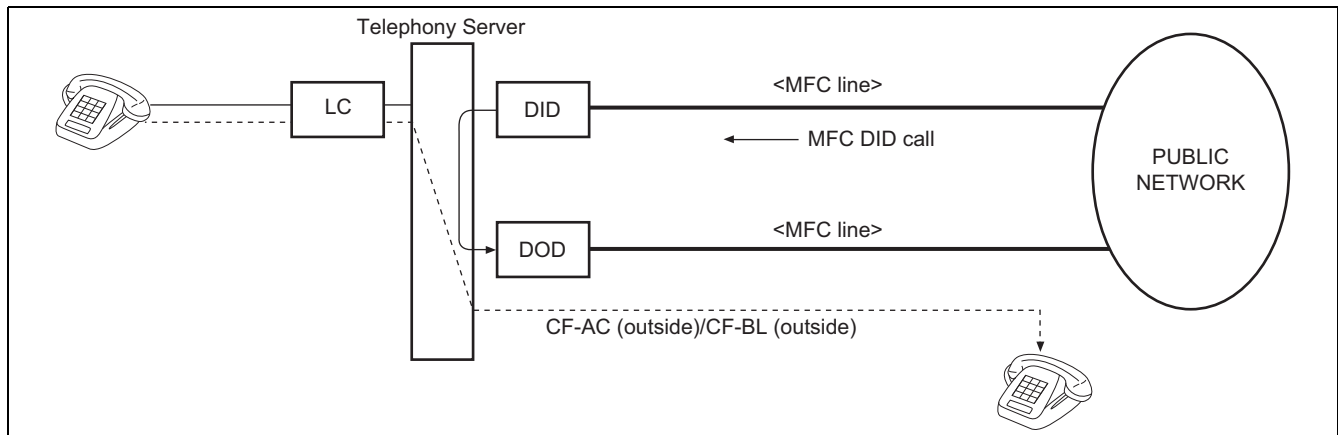
The table “[Contents of MFC Signaling for THAILAND \(TOT Specification\)](#)” shows the meanings of the forward signal and backward signal.

3.12.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as “LCR” or “LCRS” in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal or MODEM POOLING with operator assistance.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk
 - Station by Individual Trunk Access
 - Station Hold on Queuing
 - Tandem connection
 - Hotline-Outside
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk Access
 - Attendant Console with a held station
 - Attendant Console with a held trunk
 - Attendant Hold on Queuing
 - Call Forwarding-Don’t Answer-Outside
- (5) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
 - (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON’T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

- (6) A station user can transfer a DID call from/to MFC line by the following services.

**CALL FORWARDING-ALL CALLS-OUTSIDE/CALL FORWARDING-BUSY
LINE-OUTSIDE (MFC to MFC)**



- (7) The following service features are available for MFC outgoing calls.

- CALL HOLD
- CALL FORWARDING-ALL CALLS
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- INCOMING CENTRAL OFFICE CALL TO TIE LINE CONNECTION
- INDIVIDUAL TRUNK ACCESS (from ATT/Station)
- LAST NUMBER CALL
- LEAST-COST ROUTING - 3/6-DIGIT
- OUTGOING TRUNK QUEUING (STA Ring Back Queuing, STA Hold on Queuing, TANDEM Hold on Queuing)
- PEG COUNT
- RESTRICTION FROM OUTGOING CALL
- SPEED CALLING
- STATION MESSAGE DETAIL RECORDING (SMDR)
- TOLL DENIAL/TOLL DIVERSION
- TOLL RESTRICTION - 3/6-DIGIT
- TRUNK TO TRUNK CONNECTION

- (8) When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:

- G-II=1 Subscriber without Priority
- G-II=2 Subscriber with Priority

When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.

- (9) Release of MFC trunks conforms to Route Data (Calling Party Release/First Party Release) of the originating office.
- “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.12.2 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows.

<ANI Information> = <Calling Number>

Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).

- Station number of the calling party
 - Listed Directory Number which can be assigned in the AANI command on a TN basis
- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.
- (3) Depending upon data assignment in the AANI command, the following two alternatives are available.
- (a) When “*” or “#” is assigned at “LS” by the AANI command:

<ANI Information> =

Station Number

<Calling Number>

- (b) When numerical information is assigned at “LS” by the AANI command:

<ANI Information> =

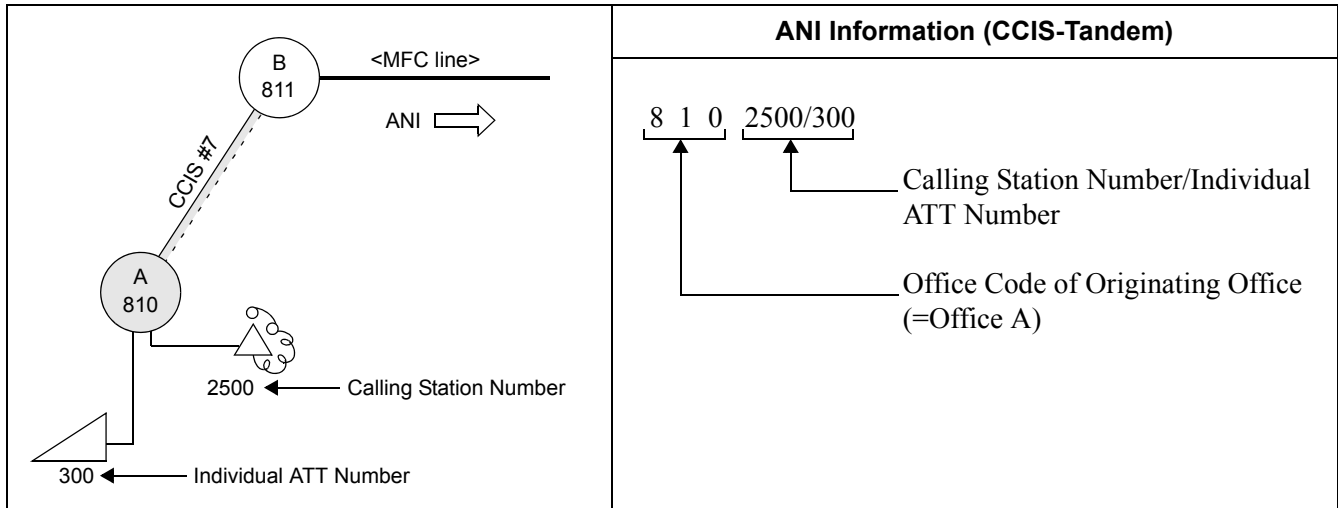
Office Code	Station Number
-------------	----------------

<Calling Number>

- (4) As the Calling Number, only numerical information (0 ~ 9) is used. “*” and “#” can not be transmitted.

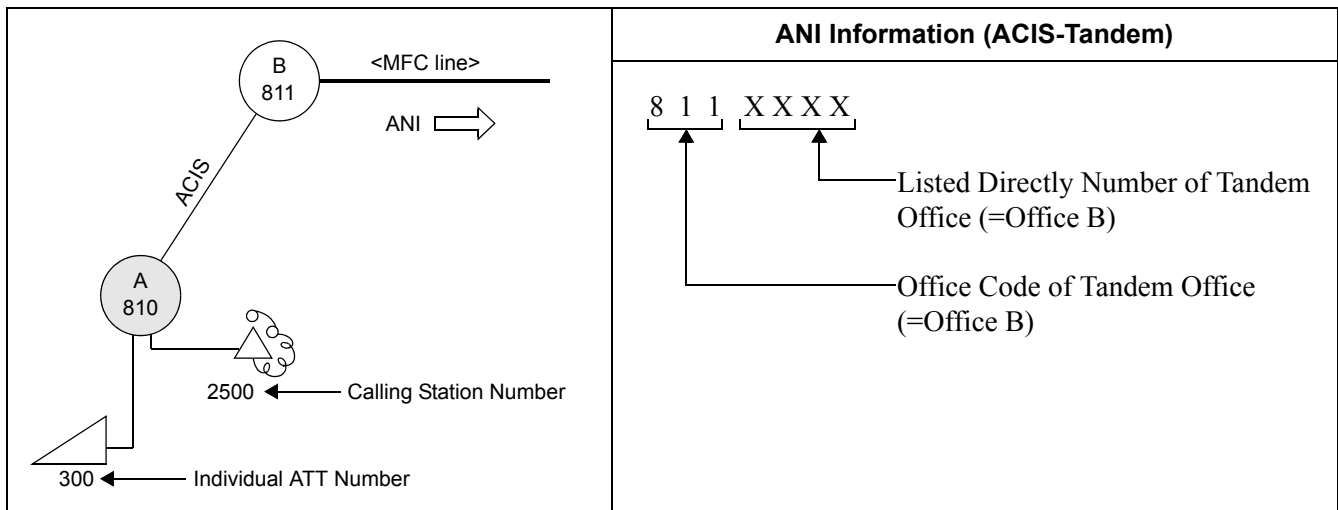
- (5) When Tandem Connection is involved, the transmitted ANI Information is comprised as shown below depending upon the Interoffice Signalling type (CCIS/ACIS).
- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7).

CCIS-Tandem



- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

ACIS-Tandem



- (6) Whether ANI Information is available or not can be determined on a route basis according to the parameter ANI of ARTI command.
- (7) The system requests ANI information after receiving all the digits of G-I signal. The maximum number of digits for G-I signal is assigned by the parameter ANI of ARTI command.

3.12.3 Service Conditions pertaining to MFC Incoming Call

- (1) Terminals to which DID [D-8] calls can be terminated from the MFC line are stations (DP, PB, Desktop terminal) and ATTCON.
- (2) For incoming call to the DTE from the MFC line, it is available by operating the DTX key on the Desktop terminal with MODEM POOLING.
- (3) When a Listed Directory Number (LDN) is received from the MFC line, calls are terminated to the ATTCON.
- (4) When calls have terminated to the UCD [U-1] group from the MFC line and all the stations in the group are busy, UCD queuing is available.
- (5) The Numbering Plan for tandem connection to an ordinary line or No. 7 CCIS line from the MFC line is limited to LCR.
- (6) For TAS [T-8] connection, if TAS connection restriction (which is set by the “ACFR” command) is allowed, a backward signal indicating subscriber’s line free is transmitted to the originating office even if the TAS Indicator is not assigned.
- (7) When a called party is idle, the call is terminated to the following terminal with respecting G-II signal which received from the originating office.
 - (a) G-II=“1” (Toll Operator) and ARTD, parameter CDN23: TR=0 ATTCON
 - (b) G-II=“8” (Intercepted Operator) and ARTD, parameter CDN23: TR=0 ATTCON
 - (c) G-II=“9” (Reserve for data terminal) and ARTD, parameter CDN23: TR=0 ATTCON
 - (d) G-II=“10” (Immediate Charge Information Service) and ARTD, parameter CDN23: TR=0
..... ATTCON

Note: ASYD, System Data 1, Index 70, Bit 0 (Called Number Display) 0/1 = Out of service/
In service
- When this data is enabled and a call is forwarded to an ATTCON, the operating party's number is displayed on the ATTCON.
- When this data is disabled, MFC incoming route/trunk number is displayed.

Note: DELAY ANNOUNCEMENT - ATTENDANT [D-114] is supported.

- (e) When the received G-II signal is other than above (a) ~ (d)..... The dialed Called Party

(8) Depending on the state of the called party, the backward signal G-B will be either of the following:

• Called party idle (charge)	G-B=1
• Called party idle (no charge)	G-B=1
• Called party idle (charge) change called party release	G-B=1
• LDN (ATTCON)	G-B=1
• Intercept to ATTCON (Called party is restricted)	G-B=1
• Call Forwarding-All Calls to ATTCON	G-B=1
• Call Forwarding-Busy Line to ATTCON	G-B=1
• Night station (station to which calls terminated to the ATTENDANT CONSOLE [A-3] are forwarded in the night mode)	G-B=1
• TAS connection	G-B=1
• Tandem Connection	G-B=1
• Call Forwarding-Outside	G-B=1
• Called party busy	G-B=2
• Lockout/Make Busy	G-B=4
• Dead number	G-B=4
• Congestion	G-B=4
• Restriction	G-B=4

(9) For incoming call from the MFC line, service features given below are available.

• CALL FORWARDING-BUSY LINE	[C-2]
• CALL FORWARDING-DON'T ANSWER	[C-3]
• CALL FORWARDING-ALL CALLS	[C-5]
• CALL FORWARDING-INTERCEPT/ANNOUNCEMENT	[C-25]
• CALL FORWARDING-OUTSIDE	[C-28]
• CALL PICKUP-GROUP	[C-7]
• CALL PICKUP-DIRECT	[C-30]
• CALL QUEUING	[C-9]
• CALL WAITING-TERMINATING	[C-12]
• DISTINCTIVE RINGING	[D-10]
• FLEXIBLE NUMBERING OF STATIONS	[F-1]
• IMMEDIATE RINGING	[I-1]
• INCOMING CALL IDENTIFICATION	[I-2]
• NIGHT CONNECTION-FIXED	[N-1]
• NIGHT CONNECTION-FLEXIBLE	[N-2]
• NIGHT CONNECTION SYSTEM-OUTSIDE	[N-17]
• PEG COUNT	[P-7]
• STATION HUNTING-CIRCULAR	[S-7]
• STATION HUNTING-SECRETARIAL	[S-8]
• STATION HUNTING-TERMINAL	[S-9]
• TRUNK ANSWER FROM ANY STATION (TAS)	[T-8]
• TENANT SERVICE	[T-12]
• UNIFORM CALL DISTRIBUTION	[U-1]

3.12.4 Service Conditions pertaining to Tandem Connection

- (1) Tandem connection from an MFC incoming trunk to the other trunks (other than MFC line) are available. However, tandem connection from a trunk other than MFC line to an MFC outgoing trunk is not available.
- (2) The tandem connection is established when the called party sets the following service features.
 - (a) MFC Incoming Trunk - Other than MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming Trunk - MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming Trunk - MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
- (3) When the outgoing call is restricted (Toll Diversion) at the tandem office, the call terminates to ATTCON.
- (4) When the outgoing call is restricted (Toll Denial) at the tandem office, the system sent GB signal of Restriction to the originating office.
- (5) OUTGOING TRUNK QUEUING is not available when the outgoing trunks are all busy at the tandem office. (Incoming trunks are MFC lines.)
- (6) Depending of the status of the called party, the backward signal G-B will be either of the following:
 - Intercept to ATT (called party restriction)..... G-B=1
 - Tandem Connection..... G-B=1
 - Call Forwarding to Outside G-B=1
 - Dead Number G-B=4
 - Congestion..... G-B=4
 - Restriction G-B=4

Contents of MFC Signaling for THAILAND (TOT Specification)

THAILAND (TOT Specification)					
CODE	FORWARD SIGNAL		BACKWARD SIGNAL		
	GROUP-I (G-I)	GROUP-II (G-II)	GROUP-A (G-A)	GROUP-B (G-B)	GROUP-C (G-C)
1	Digit “1”	Toll Operator	Send next Digit (N+1)	Called Subscriber’s Line Free (Charge)	Send Next Digit of Caller
2	Digit “2”	Ordinary Subscriber	Send First Digit of Called Number	Called Subscriber’s Line Busy	Send First Digit of Called Number
3	Digit “3”	Local Coinbox	Send Nature of Caller and G-B Signal	~~Called Subscriber’s Line Received~~	—
4	Digit “4”	—	Congestion	Congestion	~~Congestion~~
5	Digit “5”	Standard Coinbox	—	Called Subscriber’s Line Free (No Charge)	Send Next Digit of Called Number
6	Digit “6”	Test Equipment	Send Number of Caller and Change G-C	~~Last Party Release~~	—
7	Digit “7”	Line Test Desk	—	—	—
8	Digit “8”	Intercepted Operator	—	—	—
9	Digit “9”	Reserve for Data Terminal	—	—	—
10	Digit “0”	Immediate Charge Information Service	—	—	—
11	Digit “*”	—	—	—	—
12	Digit “#”	—	—	—	—
13 ~ 15	—	—	—	—	—

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

3.13 VENEZUELA

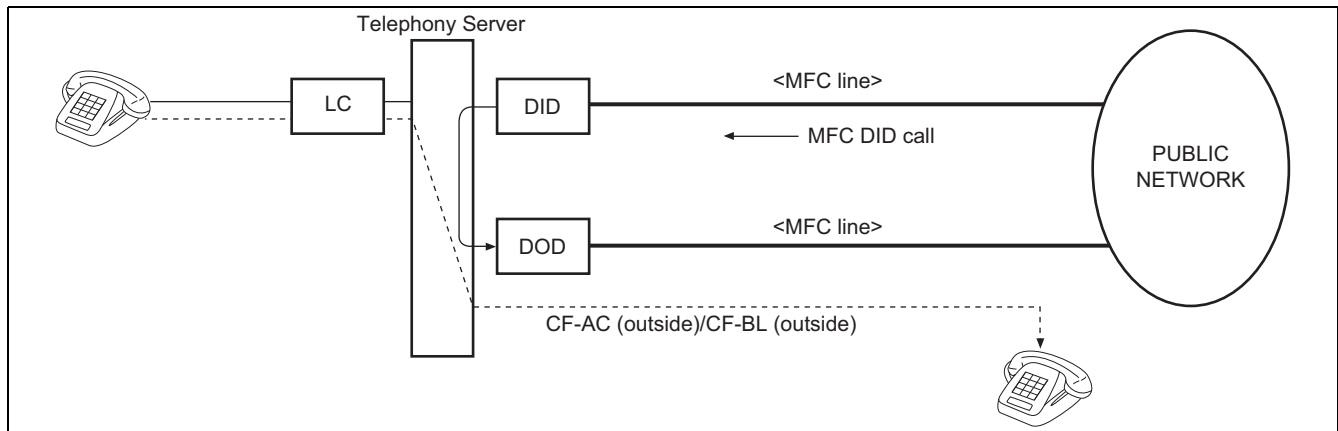
The table “[Contents of MFC Signaling for VENEZUELA](#)” shows the meanings of the forward signal and backward signal.

3.13.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as “LCR” or “LCRS” in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call originations to MFC trunks from DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal or MODEM POOLING with operator assistance.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk
 - Tandem connection
 - Station by Individual trunk Access
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk access
 - Attendant Console with a held station
 - Attendant Console with a held trunk
- (5) The tandem connection can be established when the called party sets the following CALL FORWARDING service features.
 - (a) MFC Incoming trunk - Other than MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming trunk - MFC Outgoing trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

- (6) A station user can transfer a DID call from/to MFC line by the following services.

**CALL FORWARDING-ALL CALLS-OUTSIDE/CALL FORWARDING-BUSY
LINE-OUTSIDE (MFC to MFC)**



- (7) The following service features are available for MFC outgoing calls.

- CALL HOLD
- CALL FORWARDING-ALL CALLS
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- INCOMING CENTRAL OFFICE CALL TO TIE LINE CONNECTION
- INDIVIDUAL TRUNK ACCESS (from ATT)
- LAST NUMBER CALL
- LEAST-COST ROUTING - 3/6-DIGIT
- OUTGOING TRUNK QUEUING (STA Ring Back Queuing, STA Hold on Queuing, TANDEM Hold on Queuing)
- PEG COUNT
- RESTRICTION FROM OUTGOING CALL
- SPEED CALLING
- STATION MESSAGE DETAIL RECORDING (SMDR)
- TOLL DENIAL/TOLL DIVERSION
- TOLL RESTRICTION - 3/6-DIGIT
- TRUNK TO TRUNK CONNECTION

- (8) Even if an originating office receives Group-II signal “B1 (= Change Calling Party Release)” from a terminating office, release of MFC trunks confirms to Route Data (Calling Party Release/Called Party Release) of the originating office.

- (9) When an originating office receives “Send Next Digit (N+1)” <Group-A 1> as a backward signal from the terminating office, the originating office shall transmit “End of Digit <Group-I 15>”.

When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on an incoming route basis. The following two types of G-II signals are available:

- G-II=1 Subscriber without Priority
- G-II=2 Subscriber with Priority

When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant. However, SFC=0 must not be assigned to stations in a CCIS network.

- “*” and “#” are available for the Group I (G-I) signal. Both “*” and “#” can not be used for the “Timing Start”, if those digits are used as G-I signal.

3.13.2 ANI (Automatic Number Identification) Information

- (1) ANI information is comprised as follows.

<ANI Information> = <Class Information> + <Calling Number>

- (a) Class Information (1 digit): Signifies “Calling Party Category” which is transmitted as a Group-II Forward Signal. As the “Calling Party Category”, the following two types can be selected depending upon SFC (Service Feature Restriction Class).

- Group-II CODE=1: Subscriber without Priority (can be designated by SFI 91=1)
- Group-II CODE=2: Subscriber with Priority (can be designated by SFI 91=0)

- (b) Calling Number (Office Code + Station Number, max. 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following information can be transmitted according to System Data (ASYD SYS2 INDEX 15 b2: 0/1=LDN/STN Number).

- Station number of the calling party
- Listed Directory Number which can be assigned in the AANI command on a TN basis

- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.

- (3) Depending upon data assignment in the AANI command, the following two alternatives are available.

- (a) When “*” or “#” is assigned at “LS” by the AANI command:

<ANI Information> =	Calling Party Category	+	Station Number
	<Class Information>		<Calling Number>

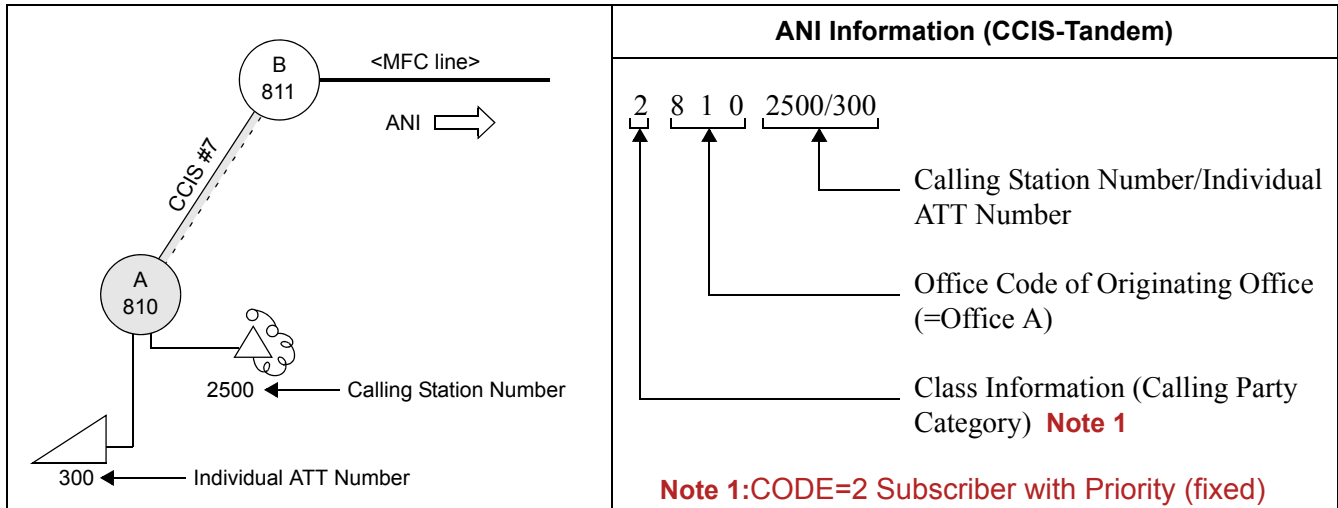
- (b) When numerical information is assigned at “LS” by the AANI command:

<ANI Information> =	Calling Party Category	+	Office Code	Station Number
	<Class Information>		<Calling Number>	

- (4) As the Calling Number, only numerical information (0 ~ 9) is used. “*” and “#” can not be transmitted.

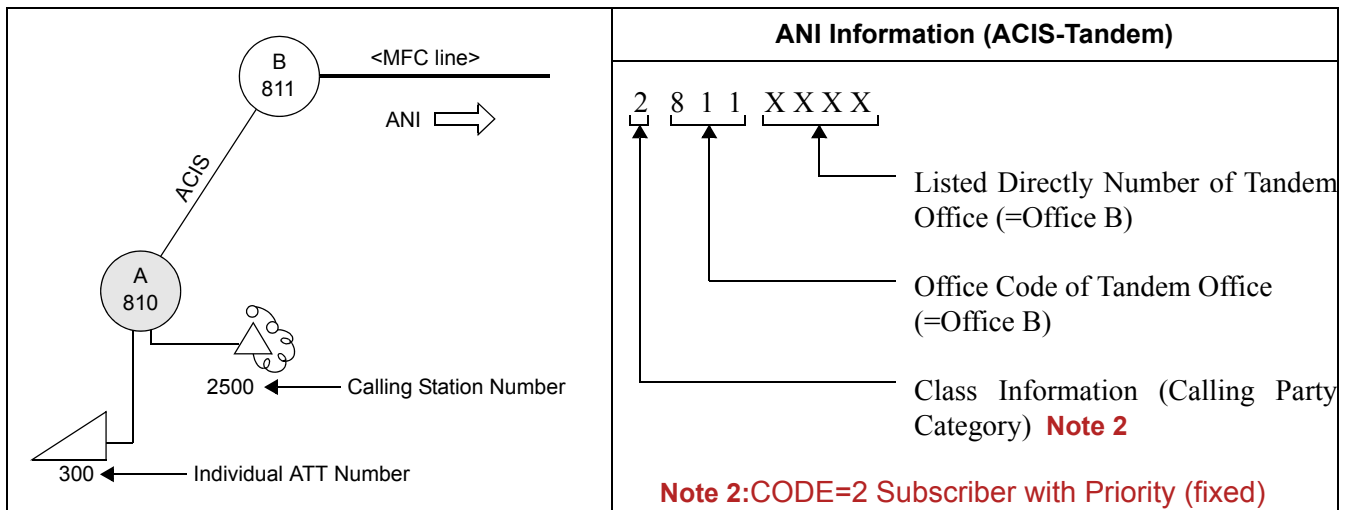
- (5) When Tandem Connection is involved, the transmitted ANI Information is comprised as shown below depending upon the Interoffice Signalling type (CCIS/ACIS).
- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7).

CCIS-Tandem



- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

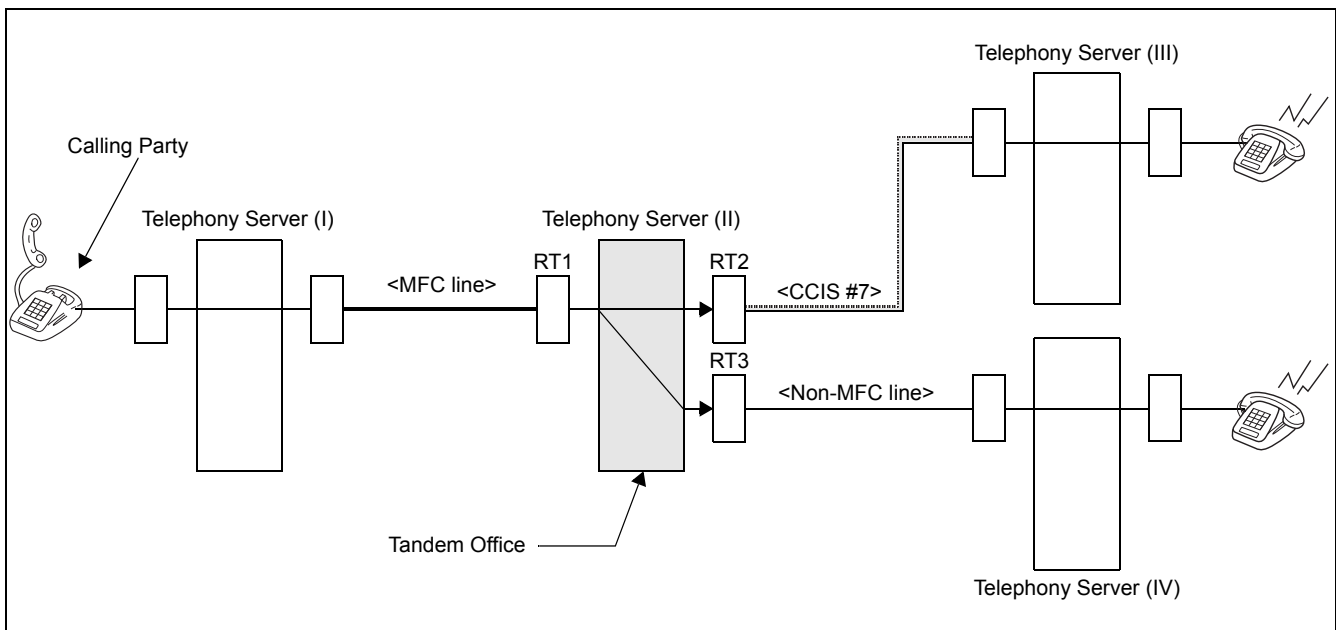
ACIS-Tandem



3.13.3 Service Conditions pertaining to MFC Incoming Call

- (1) A DID call can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (2) Call termination to DATA terminals and Service Modules are available by the DTX key operations on a Desktop terminal with MODEM POOLING.
- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).
- (4) Under the following tandem connection, from an MFC line to a CCIS #7/Non-MFC line, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 are assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to Non-MFC)



Note: In the figure above, when receiving Group-II signal (ARTD/ARTDN OC=1) or Called Party Number (ARTD/ARTDN OC=0), Telephony Server (II) allows or restricts the tandem connection (ARRC/ARRCN) between MFC and CCIS, then returns a backward signal (Group-B signal) to Telephony Server (I) regardless of status (idle, busy or restricted) of the called party accommodated in Telephony Server (III). Telephony Server (II) does not return a backward signal after receiving the status of the called party. For tandem connections from MFC line to lines other than CCIS, a relay office returns a backward signal with the same timing.

-
- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Called Party Idle” to the originating office, even if the TAS information has not been assigned in the ATAS command at the terminating office.
- (6) When a called party is idle, the incoming call is connected to the called party regardless of the received Group-II signal. (This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.) Additionally, irrespective of Group-B <B-1> (change to Called Party Release), an established link is released when the originating office releases the call.
- (7) Depending upon the called party status, the following code is transmitted as Group-B signalling:
- Called party idle (charge), change calling party release G-B=1
 - Called party busy..... G-B=3
 - Congestion..... G-B=4
 - Dead Number G-B=5
 - Called party idle (charge) G-B=6
 - LDN (ATT)..... G-B=6
 - Intercept to ATT (called party is restricted) G-B=6
 - CALL FORWARDING-ALL CALLS to ATT G-B=6
 - CALL FORWARDING-BUSY LINE to ATT G-B=6
 - NIGHT STATION G-B=6
 - TAS CONNECTION..... G-B=6
 - TANDEM CONNECTION G-B=6
 - CALL FORWARDING-OUTSIDE..... G-B=6
 - Lockout/Make Busy G-B=8
 - Restriction G-B=8
- (8) With regard to an MFC Incoming Call, the following service features are available:
- CALL FORWARDING-ALL CALLS
 - CALL FORWARDING-BUSY LINE
 - CALL FORWARDING-DON’T ANSWER
 - CALL FORWARDING-ALL CALLS-OUTSIDE
 - CALL FORWARDING-BUSY LINE-OUTSIDE
 - CALL FORWARDING-OUTSIDE (from Night Station Call)
 - CALL FORWARDING INTERCEPT TO STN/ATT
 - CALL PICKUP
 - CALL QUEUING
 - CALL WAITING-TERMINATING
 - DISTINCTIVE RINGING
 - IMMEDIATE RINGING
 - INCOMING CALL IDENTIFICATION
 - MULTI NUMBERING
 - NIGHT CONNECTION
 - PEG COUNT
 - STATION HUNTING-CIRCULAR
 - STATION HUNTING-TERMINAL
 - STATION HUNTING-SECRETARIAL
-

- TRUNK ANSWER FROM ANY STATION (TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION
- UNIFORM NUMBERING PLAN
- REMOTE ACCESS TO SYSTEM

Contents of MFC Signaling for VENEZUELA

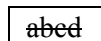
VENEZUELA				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP-I	GROUP-II Note 1	GROUP-A	GROUP-B
1	Digit “1”	Standard Subscriber	Send Next Digit (N+1)	Subscriber’s Line Free (Change Call Party Release)
2	Digit “2”	Preferential Subscriber	Send Last but One Digit (N-1)	~~Extension Number Changed~~
3	Digit “3”	Test Subscriber	Address Complete, Changeover to Reception of Group-B	Subscriber’s Line Busy
4	Digit “4”	Coin Phone	Congestion	Congestion
5	Digit “5”	Attendant	Send Category of Calling Subscriber	Unallocated Number
6	Digit “6”	Data Transmission	Address Complete, Change Setup Speech Condition	Subscriber’s Line Free (With Charge)
7	Digit “7”	—	Send Last but Two Digits (N-2)	Subscriber’s Line Free (Without Charge)
8	Digit “8”	—	Send Last but Three Digits (N-3)	Subscriber’s Line Out of Order
9	Digit “9”	—	Send Originating Subscriber Number	—
10	Digit “0”	—	—	~~Data Transmitting Equipment~~
11	Digit “*”	—	—	—
12	Digit “#”	—	—	—
13	—	—	—	—
14	—	—	—	—
15	End of Pulsing	—	—	—

Contents of MFC Signaling for VENEZUELA

VENEZUELA				
CODE	FORWARD SIGNAL		BACKWARD SIGNAL	
	GROUP-I	GROUP-II Note 1	GROUP-A	GROUP-B

 : Signals transmitted and received

 : Signals received

 : Signals not handled in the system

Note 1: Only when the category of Attendant is to be transmitted, GII-1 through GII-15 can be used.

3.14 KUWAIT

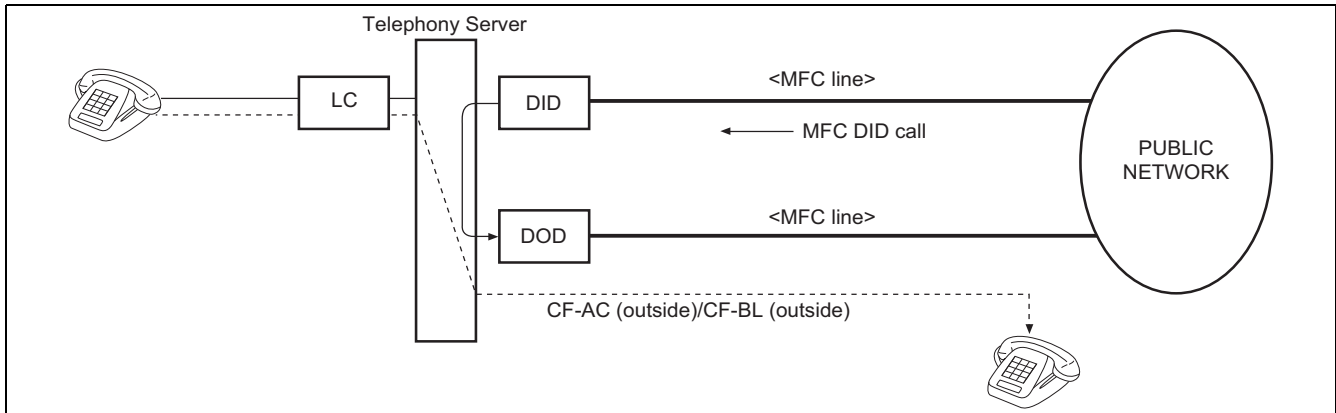
The tables “Contents of MFC Signaling for KUWAIT (FORWARD SIGNAL)” and “Contents of MFC Signaling for KUWAIT (BACKWARD SIGNAL)” show the meanings of the forward signal and backward signal.

3.14.1 Service Conditions pertaining to MFC Outgoing Call

- (1) MFC trunk access code must be assigned as “LCR” or “LCRS” in the ASPA command.
- (2) The following terminals can place a direct MFC trunk call.
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
- (3) Call origination to MFC trunks from DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal or MODEM POOLING with operator assistance.
- (4) Under the following status, MFC trunk access is permitted.
 - Station without a held station/trunk
 - Station with a held station
 - Station with a held trunk (tandem via station)
 - Station by Individual Trunk Access
 - Station Hold on Queuing
 - TANDEM (TRK to MFC)
 - Tandem Connection from an ACIS line to an MFC line
 - Tandem Connection from a CCIS NO.7 line to an MFC line
 - Tandem Connection from an ISDN line (ETSI) to an MFC line
 - Tandem Connection from an MFC line to another MFC line (end to end)
 - Hotline-Outside
 - Attendant Console without a held station/trunk
 - Attendant Console by Individual Trunk Access
 - Attendant Console with a held station
 - Call Forwarding-Don't Answer to Outside
- (5) The tandem connection is established when the called party sets the following service features.
 - (a) MFC Incoming Trunk - Other than MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - CALL FORWARDING-DON'T ANSWER-OUTSIDE [C-74]
 - (b) Other than MFC Incoming Trunk - MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]
 - (c) MFC Incoming Trunk - MFC Outgoing Trunk
 - CALL FORWARDING-ALL CALLS-OUTSIDE [C-28]
 - CALL FORWARDING-BUSY LINE-OUTSIDE [C-60]

- (6) A station user can transfer a DID call from/to MFC line by the following services.

**CALL FORWARDING-ALL CALLS-OUTSIDE/CALL FORWARDING-BUSY
LINE-OUTSIDE (MFC to MFC)**



- (7) The forward signal G-II is fixed at “2” (Subscriber).
- (8) Release of MFC trunks conforms to Route Data (Calling Party Release/First Party Release) of the originating office.
- (9) Consider the following conditions for making an “LCRS” call via MFC line.
- Station: MFC sender and RST for the station to make a call shall be accommodated in the same IMG
 - Attendant Console: MFC sender and ATI card connecting the console shall be accommodated in the same IMG

If the above condition is not satisfied, the call is made as an “LCR” call.

- (10) The following service features are available for MFC outgoing calls.

- ALTERNATE ROUTING
- BROKERAGE HOTLINE-OUTSIDE
- CALL HOLD
- CALL TRANSFER-ALL CALLS
- CONSULTATION HOLD-ALL CALLS
- CALL FORWARDING OVERRIDE
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- CONSECUTIVE SPEED CALLING-SYSTEM
- CALL FORWARDING-DON'T ANSWER-OUTSIDE
- DIRECT OUTWARD DIALING (DOD)
- HOT LINE-OUTSIDE
- INDIVIDUAL TRUNK ACCESS
- LEAST COST ROUTING-3/6-DIGIT
- LAST NUMBER CALLED-SINGLE-LINE STATION
- LCR-TIME OF DAY ROUTING
- MUSIC ON HOLD
- OUTGOING TRUNK QUEUING
- OFF-HOOK QUEUING

- OUTGOING TRUNK BUSY ANNOUNCEMENTS
- PEG COUNT
- PERIODIC TIME INDICATION TONE
- PAD LOCK
- RESTRICTION FROM OUTGOING CALLS
- SPEED CALLING-SYSTEM
- STATION MESSAGE DETAIL RECORDING (SMDR)
- TOLL DENIAL/TOLL DIVERSION
- TOLL RESTRICTION-3/6-DIGIT
- TENANT SERVICE

3.14.2 ANI (Automatic Number Identification) Information

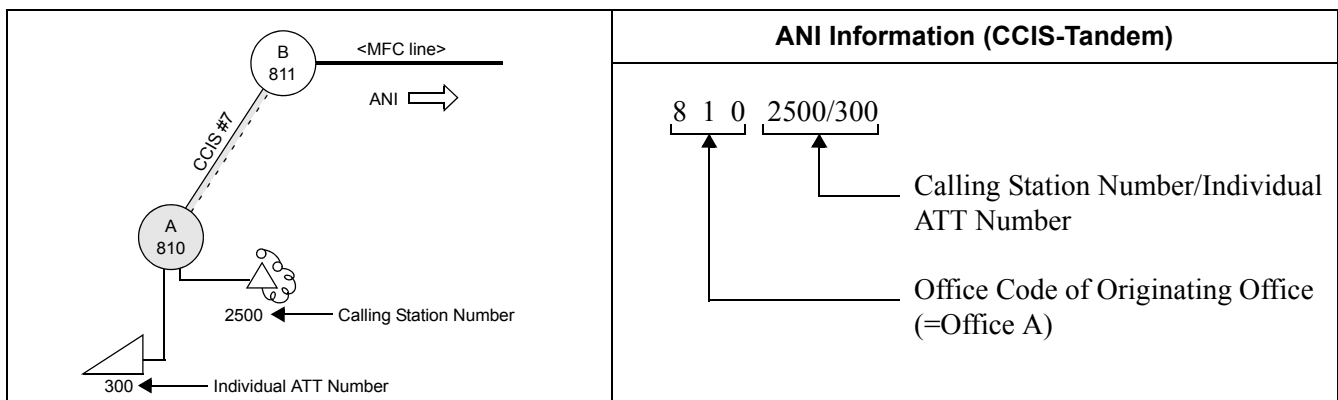
- (1) ANI information is comprised as follows.

<ANI Information> = <Calling Number>

Calling Number (Office Code + Station Number, max 12 digits): Office Code is assigned by the AANI command on a tenant basis. As the station number, one of the following can be transmitted according to System Data (ASYD SYS2 INDEX15 b2: 0/1=LDN/STN Number).

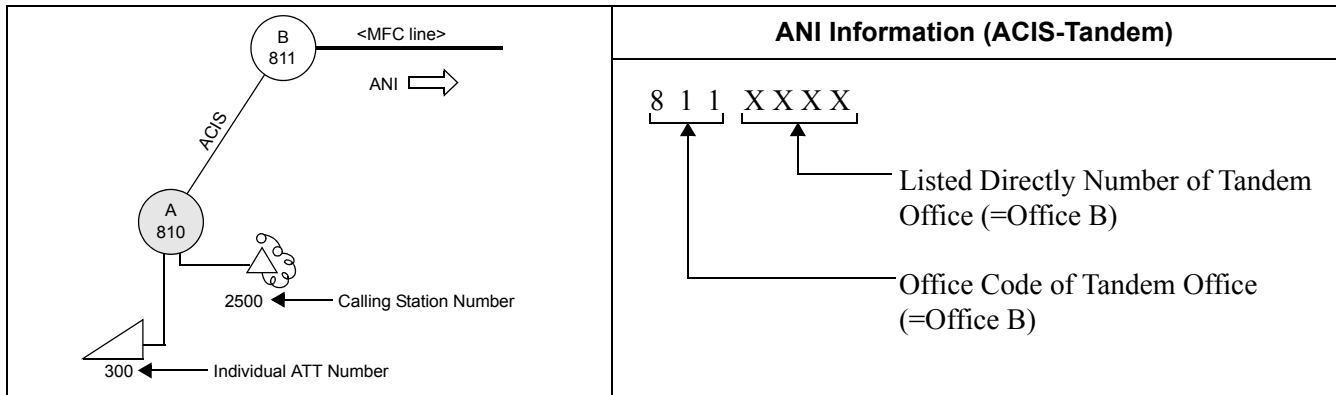
- Station number of the calling party
 - Listed Directory Number (LDN) which can be assigned in the AANI command on a TN basis
- (2) When an operator places an MFC outgoing call, the LDN is transmitted as the station number.
- (3) When Tandem Connection is involved, the transmitted ANI Information is comprised as shown below depending upon the Interoffice Signaling type (CCIS/ACIS).
- (a) CCIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which conforms to CCIS No. 7 (Common Channel Interoffice Signaling No. 7). In this case, the ARNP/ASAT commands must be assigned.

CCIS-Tandem



- (b) ACIS-TANDEM: ANI information is composed as follows when a calling party accesses an MFC line through a tie line which employs ACIS (Associated Channel Interoffice Signaling).

ACIS-Tandem



- (4) The forward signal G-II is fixed at “2” (Subscriber) when a tandem connection with CCIS or ASIC is involved.
- (5) As the Calling Number, only numerical information (0~9) is used. “*” and “#” can not be transmitted.
- (6) Depending upon data assignment in the AANI command, the following two alternatives are available.
- (a) When “*” or “#” is assigned at “LS” in the AANI command:

$$\langle \text{ANI Information} \rangle = \begin{array}{|c|} \hline \text{Station Number (or LDN)} \\ \hline \end{array} \\ \langle \text{Calling Number} \rangle$$

- (b) When numeric information is assigned at “LS” by the AANI command:

$$\langle \text{ANI Information} \rangle = \begin{array}{|c|c|} \hline \text{Office Code} & \text{Station Number (or LDN)} \\ \hline \end{array} \\ \langle \text{Calling Number} \rangle$$

- (7) Whether ANI Information is available or not can be determined on a route basis according to the parameter ANI of ARTI command.
- (8) Whether to request or not ANI information can be determined according to Service Feature Restriction Class of the called party.

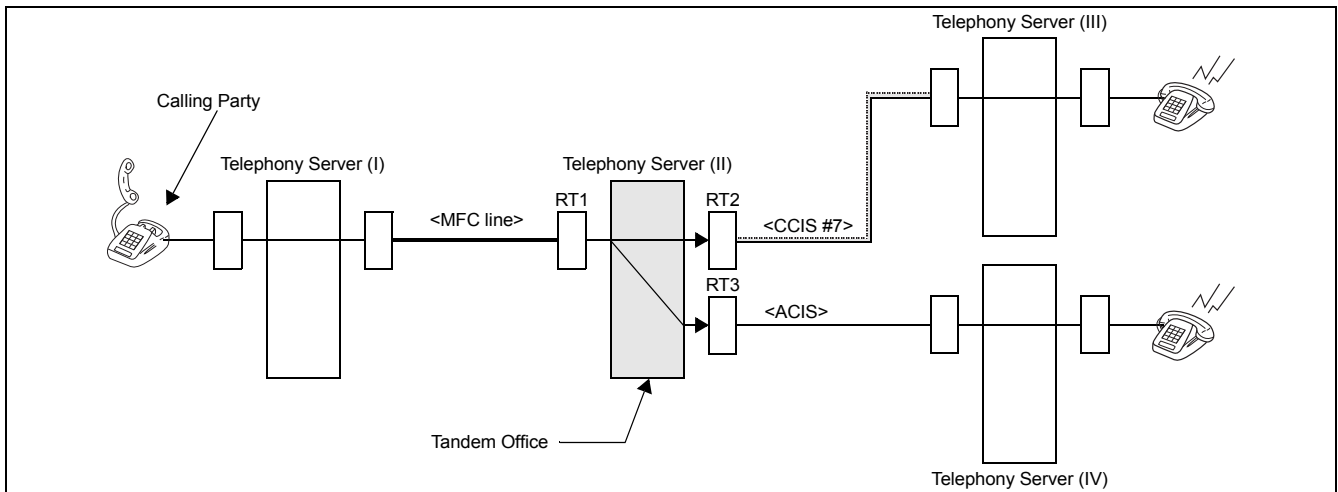
(9) Timing to demand ANI Information is as follows:

- (a) When $\text{G-I Receive Digits}^{①} \geq \text{Timing to demand ANI Information}$ (specified by parameter ANI of ARTI command (CDN31)) :
- ↓
- After receiving ①, ANI Information is demanded
- (b) When $\text{G-I Receive Digits}^{②} < \text{Timing to demand ANI Information}$ (specified by parameter ANI of ARTI command (CDN31)) :
- ↓
- After receiving ②, ANI Information is demanded

3.14.3 Service Conditions pertaining to MFC Incoming Call

- (1) A DID call via MFC line can terminate to the following terminals:
 - Station (DP, PB, Desktop terminal)
 - Attendant Console
 - Voice Mail Equipment
- (2) Call termination via MFC line to DATA terminals and Service Modules are available by DTX key operations on a Desktop terminal or MODEM POOLING with operator assistance.
- (3) When an Attendant Console is desired as a destination of an MFC incoming call, the incoming call can terminate to the Attendant Console by dialing the LDN (Listed Directory Number).
- (4) Under the following tandem connection, from an MFC line to a CCIS #7/ACIS, trunk access must be assigned as “LCR” or “LCRS” at the tandem office. In this example, access codes for RT2 and RT3 are assigned as “LCR” or “LCRS” at the Telephony Server (II).

Tandem Connection (MFC to CCIS No. 7/MFC to ACIS)



- (5) With regard to TAS (Trunk Answer from Any Station) service, when TAS connection restriction has been removed in the ACFR command, the terminating office returns a backward signal “Called Party Idle” to the originating office, even if the TAS information has not been assigned in the ATAS command at the terminating office.
- (6) When a called party is idle, the incoming call is connected to the called party regardless of the received Group-II signal. This condition, however, does not apply to “Call Forwarding” and “Station Hunting”. In the case of these features, the incoming calls are transferred to the predetermined destinations.
- (7) Release of MFC trunks conforms to Route Data (Calling Party Release/First Party Release) of the incoming route.
- (8) Called Number Display (Max 16 digits) is available for ANI (Automatic Number Identification) information.
- (9) Even if a call from the operator (GII-1) terminates to a busy station, “Trunk Offering Facility” is invalid.
- (10) Depending on the state of the called party, the backward signal G-B will be either of the following:
 - Called party idle (charge) G-B=1
 - Called line busy G-B=2
 - Congestion G-B=2
 - Dead number/Dead level G-B=2
 - LDN (ATTCON) G-B=1/5 (**Note 1**)
 - Intercept to ATTCON (Called party is restricted) G-B=3
 - Call Forwarding-All Calls to ATTCON G-B=1/5 (**Note 1**)
 - Call Forwarding-Busy Line to ATTCON G-B=1/5 (**Note 1**)
 - Night station G-B=1/5 (**Note 1**)
 - TAS connection G-B=1
 - Tandem connection G-B=1
 - Call Forwarding to Outside G-B=1
 - Called party idle (no charge) G-B=5
 - Lock out/Make Busy G-B=2
 - Restriction G-B=2

Note 1: When the called party is in this state, either B=1 or B=5 will be sent according to the SFC (SFI 59 and 60) of the called party.

(11) With regard to an MFC Incoming Call, the following service features are available:

- CALL FORWARDING-BUSY LINE
- CALL FORWARDING-DON'T ANSWER
- CALL FORWARDING-ALL CALLS
- CALL HOLD
- CALL PICKUP-GROUP
- CALL TRANSFER-ALL CALLS
- CALL WAITING-TERMINATING
- CALL WAITING LAMP
- CONSULTATION HOLD-ALL CALLS
- CALLING NUMBER DISPLAY-D
- CALL PICKUP-DIRECT
- CALL FORWARDING-ALL CALLS-OUTSIDE
- CALL FORWARDING-BUSY LINE-OUTSIDE
- CALL FORWARDING-DON'T ANSWER-OUTSIDE
- DIRECT INWARD DIALING (DID)
- DISTINCTIVE RINGING
- IMMEDIATE RINGING
- LDN NIGHT CONNECTION
- MUSIC ON HOLD
- MULTIPLE CALL FORWARDING-BUSY LINE
- MULTIPLE CALL FORWARDING-DON'T ANSWER
- MESSAGE CENTER INTERFACE
- MULTIPLE CALL FORWARDING-ALL CALLS
- NIGHT CONNECTION-FIXED
- NIGHT CONNECTION-FLEXIBLE
- PEG COUNT
- REMOTE ACCESS TO SYSTEM
- TRUNK ANSWER FROM ANY STATION (TAS)
- TENANT SERVICE
- UNIFORM CALL DISTRIBUTION (UCD)
- PERIODIC TIME INDICATION TONE

Contents of MFC Signaling for KUWAIT (FORWARD SIGNAL)

KUWAIT			
CODE	FORWARD SIGNAL		
	GROUP-I	GROUP-II	GROUP-III
1	Digit “1”	Operator (With Trunk offering facility)	~~Insert Interception Mark~~
2	Digit “2”	Subscriber (May also indicate unknown category after signal A3)	~~Erase Interception Mark~~
3	Digit “3”	Reserved for coin box	~~Read (?) Interception Mark~~
4	Digit “4”	Subscriber with immediate charging service	—
5	Digit “5”	Reserved for Subscriber with Priority	—
6	Digit “6”	Line Test Desk	—
7	Digit “7”	Reserved for Line Test Desk	—
8	Digit “8”	Interception Service	—
9	Digit “9”	Reserved for Subscriber or Operator (International Call)	—
10	Digit “0”	Reserved for Subscriber or Operator (International Call)	—
11	Digit “*”	—	—
12	Digit “#”	Reserved for Data Transmission Equipment	—
13	~~Reserved to Access maintenance equipment~~	—	—
14	~~Access to RCE-B No.~~	—	—
15	End of Number	Unknown Category	—

 : Signals transmitted and received

 : Signals received

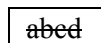
 : Signals not handled in the system

Contents of MFC Signaling for KUWAIT (BACKWARD SIGNAL)

KUWAIT						
CODE	BACKWARD SIGNAL					
	GROUP-A	GROUP-B	GROUP-C	GROUP-D	GROUP-E	GROUP-F
1	Send Next Digit [N+1]	Subscriber's line free Charge	- Send First [Next] Digit of caller's Number - Sending Immediately After Signal I-15 Means: - Send Next Digit [N+1] of the Called Number and Change Over to Reception of A-Signals	Not Used	Send Next Digit	Subscriber's Line Intercept
2	Send First Digit Transmitted	Subscriber's line Busy or Congestion	Send first Digit of the Called Number and Change Over to Reception of A Signals	Not Used	—	Subscriber's Line Not Intercept
3	Send Group II Signal and Change Over to Reception of B-Signals	Subscriber's line Interception	Send Group II Signal and Change Over to Reception of B-Signals	Not Used	Send Group III Signals and Change Over to Reception of F-Signal	—
4	Congestion	Subscriber's line RCE Marked	Congestion	Not Used	—	—
5	—	Subscriber's line Free, No Charge	Send Next Digit [N+1] of the Called Number and Change Over to Reception of A-Signals	Not Used	—	—
6	Send Group II Signal and Change Over to Reception of C-Signals	Subscriber's line Free, Last Party Release	Send Same Digit [N] of the Called Number and Change Over to Reception of A-Signals	Not Used	—	—
7	—	—	—	—	—	—
8	—	—	—	—	—	—
9	—	—	—	—	—	—
10	—	—	—	—	—	—
11	—	—	—	—	—	—
12	—	—	—	—	—	—
13	—	—	—	—	—	—
14	—	—	—	—	—	—
15	—	—	—	—	—	—

 : Signals transmitted and received

 : Signals received

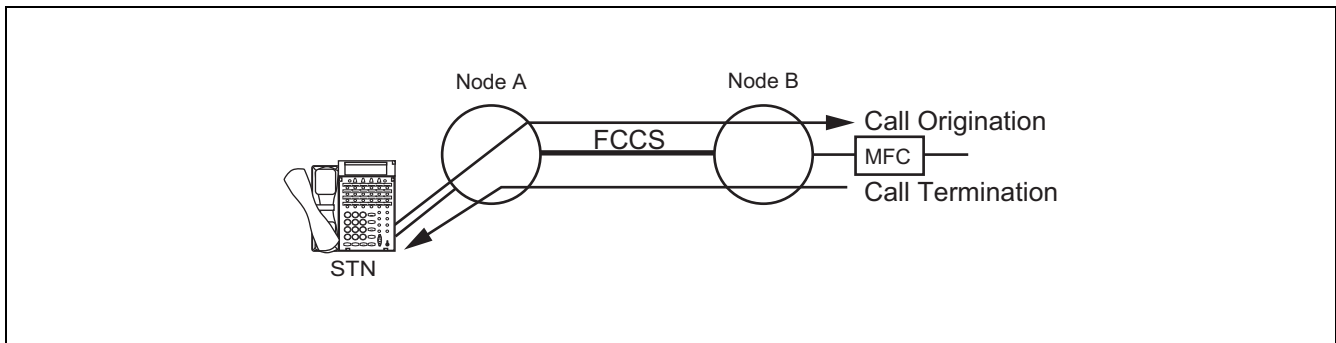
 : Signals not handled in the system

4. MFC in FCCS System

In the FCCS system, MFC trunks accommodated in another node can be used for DOD/DID calls via FCCS link under the following conditions. For detailed information on the FCCS, refer to the Data Programming Manual - FCCS.

Note: FCCS stands for Fusion Call Control Signaling.

MFC DOD/DID Call via FCCS



- (1) Both MFC Receiver and MFC Sender must be accommodated in each node.
- (2) When an MFC DOD call is originated from a station in Node A through an MFC trunk in Node B via FCCS link, MFC Sender accommodated in Node A is used.
- (3) When a call is terminated from an MFC trunk in Node B to a station in Node A, MFC Receiver accommodated in Node B is used.
- (4) When an MFC incoming call is terminated from an MFC trunk in Node B to a station in Node A, if the connection trunk cannot be used, Backward Signal "Congestion" is sent.
- (5) Be sure to assign the same data to ASYD command, SYS 1, Index 125, Bits 4 through 7 (MFC Signaling System) for each node.

4.1 ANI (Automatic Number Identification) Information (except for Indonesia)

- (1) The office code in ANI information is determined by the parameter LS of AANI command. For example, when AANI command is assigned as follows, "90" is sent as the office code.

AANI, TS: (blank), LS: 90, LDN: 54321 → Office Code to be sent: 90

- (2) ANI information is comprised as follows.
 - (a) When an MFC DOD call is originated from the Attendant:
ANI = Office Code + LDN Number
 - (b) When a call from an ACIS line is routed to an MFC trunk via tandem connection:
ANI = Office Code of Tandem Office + LDN Number of Tandem Office
 - (c) When a call from a CCIS line is routed to an MFC trunk via tandem connection:

ANI = Office Code of Originating Office + LDN Number/Individual ATT Number of Originating Office

- (d) When an MFC DOD call is originated from a station:
- ASYD, SYS2, Index 15, bit 2 = 0 (LDN Number to be sent):
ANI = Office Code + LDN Number
 - ASYD, SYS2, Index 15, bit 2 = 1 (station number to be sent):
 - When Telephone Number is assigned within 6 digits:
ANI = Office Code + Telephone Number
 - When Telephone Number is assigned 7 digits or more/not assigned:
ANI = Office Code + Physical Station Number

4.2 ANI (Automatic Number Identification) Information (Indonesia)

- (1) The office code in ANI information is determined by AAND command. For example, when AAND command is assigned as follows, “1234” is sent as the office code.

AAND, DC: 1234567890, SKIP: 6 → Office Code to be sent: 1234

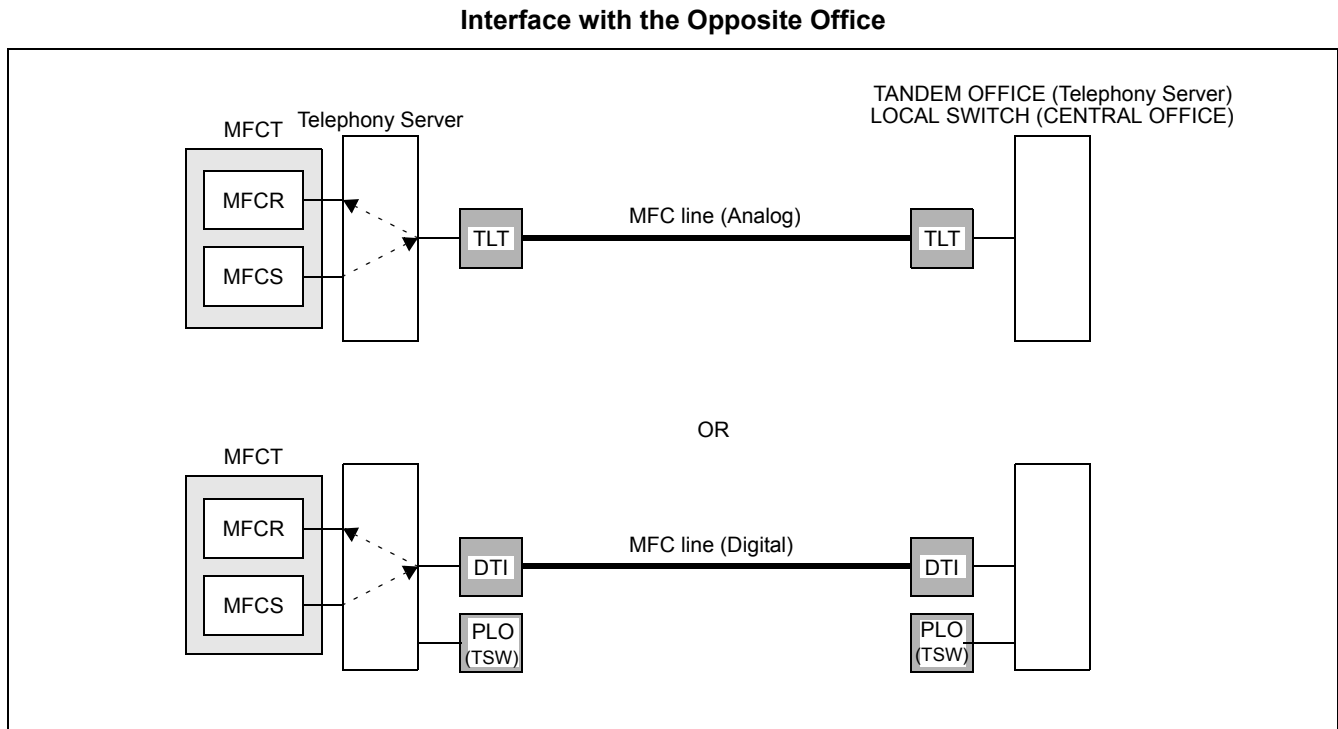
- (2) ANI information is comprised as follows.
- (a) When Telephone Number is assigned within 6 digits:
ANI = Office Code + Telephone Number
- (b) When Telephone Number is assigned 7 digits or more/not assigned:
ANI = Office Code + Physical Station Number



CHAPTER 3 INSTALLATION

1. INTERFACE WITH THE OPPOSITE OFFICE

The figure below shows the interface with the opposite office when using a MFC Signal Interface.



2. INSTALLATION PROCEDURE

Observe the following procedure when mounting a circuit card into the PIR to which power is being supplied.

- (1) Set the MB key upwards on the circuit card.
- (2) Mount the circuit card into the PIR.
- (3) Set the MB key downwards on the circuit card.

3. PA-4MFCA-B/PA-4MFCA CIRCUIT CARD

Refer to Circuit Card Description for detailed information of SW setting.



CHAPTER 4

DATA ASSIGNMENT PROCEDURE

This chapter is comprised of the following Sections.

1. MFC LINE ACCESS CODE ASSIGNMENT
2. MFC SIGNAL INTERFACE
3. SMFC SIGNAL INTERFACE FOR INDONESIA
4. SERVICE FEATURES

1. MFC LINE ACCESS CODE ASSIGNMENT

To initiate seizure of an outgoing trunk, one of four methods – OGC, OGCA, LCR, LCRS – can be used in the system. Among the four methods, however, only “LCR” or “LCRS” method can access a MFC line. For this reason, be sure to select “LCR” or “LCRS” as “Kind of service (SRV)” in the ASPA command. The following explains how to program LCR /LCRS data.

Note: ASPAL, ARNPL, ARTDN, AFRSL, AOPRL and ARSCN commands are used in the FCCS system.

STEP 1: ANPD – Assign the first digit of the LCR /LCRS access code for the MFC line.

STEP 2: ASPA/ASPAL– Assign the LCR/LCRS access code for a dummy route number.

- Any dummy route number can be used if the route number is not duplicated.
- The Register Inter Digit Timer is determined by ASYD SYS1 INDEX129. (ROM data = 6 sec.)

STEP 3: AMND– Assign the Maximum Necessary Digits (MND) for each Area/Office code (DC).

- DC may include MFC trunk access code.
- Analog/Digital Line Data (A/D) must be assigned as “Analog.”

STEP 4: ARNP/ARNPL– Assign the MFC trunk access code to the MFC route number, but not a dummy route number.

STEP 5: ARTD/ARTDN– Assign the following CDN data for the dummy route number.

- CDN6 : TCL= 1
- CDN7 : L/T= 1
- CDN13 : AC= 1
- The other CDNs may be left default (data 0) for the dummy route.

STEP 6: AFRS/AFRSL– Assign Number Pattern Code (NPC) and Outgoing Route Selection Pattern Number (OPR) for the dummy route number.

- NPC may include MFC trunk access code.
- OPR is a kind of intermediary between AFRS/AFRSL and AOPR/AOPRL. Therefore any number may be used from 0 through 4000. (Be careful not to assign duplicated OPR.)

STEP 7: AOPR/AOPRL– Assign MFC route number to the OPR which has been assigned in the AFRS command.

- Since the system should transmit only Public Network subscriber number, skip the MFC trunk access code.
- Route advance is available by programming RA, E and RT/LGRT. OVFT is also available.
- ACMO is available with programming PNL.
- ATPC and/or ASDC is available with programming TDPTN.

STEP 8: ARSC/ARSCN– Assign RSC that allows RRI for both MFC trunk route and the dummy route.

2. MFC SIGNAL INTERFACE

This Section explains the data assignment procedure for the MFC Signal Interface. When the system has MFC Tie Line, the same system data must be assigned in each office.

STEP 1: ASYD/ASYDN– Assign appropriate data in the following indexes which are related to MFC signaling.

Note 1

Note 1: ASYDN command is used for the FCCS system. When the same system data is assigned to all nodes, use ASYDN command. ASYDN command takes precedence over ASYD command.

- SYS1, INDEX64
b0 (Analog/Digital Conversion System): 0/1= μ -law/A-law
- SYS1, INDEX92
b0 (ANI Information): 0/1=Tenant Basis/System Basis **Note 2**

Note 2: In the FCCS system, data in the node of the originating party is used.

- SYS1, INDEX125
b0 ~ b3 (Designation of PAD Value): This PAD value is used for adjusting transmission level of MFCS (=MFC Sender).

PAD Value Table

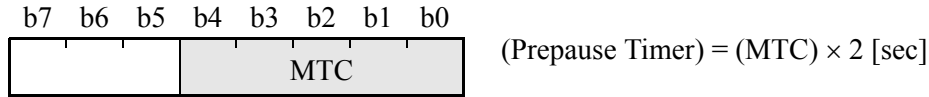
Input Data	PAD Value (db)	Input Data	PAD Value (db)
0	0	4	-8
1	-2	5	-10
2	-4	6	-11.5
3	-6	7	-14

b4 ~ b7 (Type of MFC): Select appropriate MFC type from the table shown below.

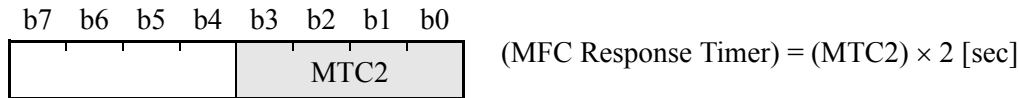
Type of MFC

Input Data	Type of MFC	Input Data	Type of MFC
0	CCITT-R2 (NEC Standard)	8	Indonesia (SMFC)
1	Australia (D1301G)	9	Mexico
2	Thailand (TOT)	A	Brazil
3	Venezuela	B	Chile
4	Korea	C	Colombia
5	Singapore (PSA)	D	India
6	China	E	Kuwait
7	Argentina/Philippines	F	—

- SYS1, INDEX126
b7 (Forward Signal): G-I="15" (End of Digit): 0/1=Sent out/Not sent out.
- SYS1, INDEX128
b0 ~ b4 (Prepause Timer): The 1st Forward Signal must be received within this timer (= T1). See the figure entitled "Reference-MFC Signaling Sequence" on the next page.



- SYS1, INDEX132
b0 ~ b3 (MFC Response Timer): After transmission of a Backward Signal, the existing Forward Signal must be stopped within this timer (= T2). See "Reference-MFC Signaling Sequence" on the next page.

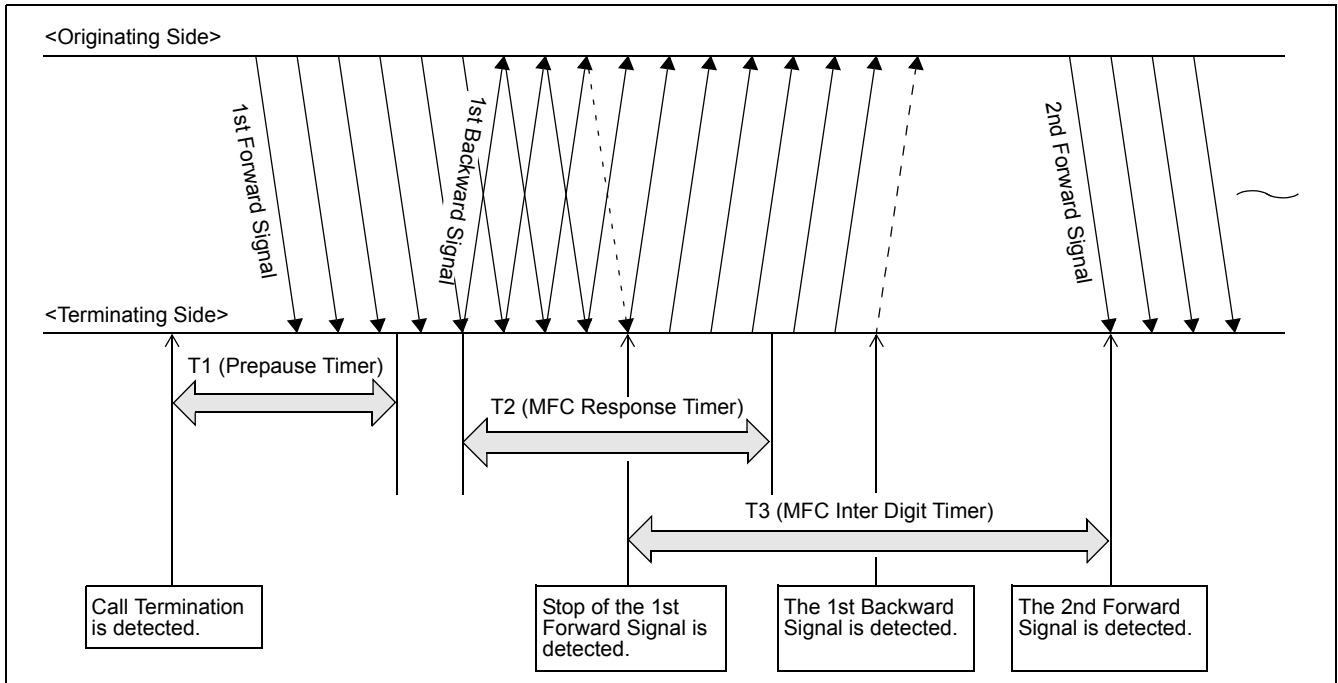


- SYS1, INDEX133
b0 ~ b3 (MFC Inter Digit Timer): After detecting stop of a Forward Signal, next Forward Signal must be received within this timer (= T3). See " on the next page.
- SYS1, INDEX161
b6, b7 (Timing Start using "#" and "*" Codes): Assign "0" at b6 and b7, if these "#" and "*" digits are used as G-I signal.
- SYS1, INDEX230
b3 (Timing for sending of MFC Forward Signals):
0=When backward signal transmission is stopped
1=When backward signal is received



- SYS1, INDEX403
b2 (SMDR output when receiving GB signal "Called Party Idle without Charge")
: 0/1=Not required/Required.
- SYS1, INDEX451
b0 (OAI Call Origination to MFC Trunk)
: 0/1=Out of service/In service.

Reference-MFC Signaling Sequence



- SYS2, INDEX15
b2 (Designation of Calling Number in ANI Information): 0/1=LDN/STN Number
- SYS3, INDEX10
b0 ~ b3 (Designation of Sensitivity Level of MFC Receiver (= T))
b7 (ACT): 0/1 = -38 dbm (fixed)/depends on input data (INDEX10 b0 ~ b3)

MFC Receiver Sensitivity Level

T	Sensitivity Level [dbm]	T	Sensitivity Level [dbm]
0	-28	8	-36
1	-29	9	-37
2	-30	A	-38
3	-31	B	-39
4	-32	C	-40
5	-33	D	-41
6	-34	E	-42
7	-35	F	-43

STEP 2: ARTD/ARTDN– Assign Route Data for MFC lines paying attention to the following parameters.

Note 3

Note 3: ARTDN command is used for the FCCS system.

CDN1: OSGS (Outgoing Signal Interface): 2 (Second Dial Tone)

CDN2: ONSG (Outgoing Select Signal): 10 (= MFC)

CDN3: ISGS (Incoming Signal Interface): 2 (Second Dial Tone)

CDN4: INSG (Incoming Select Signal): 10 (= MFC)

CDN19: ANI (Automatic Number Identification): 0/1=~/In Service

CDN23: TR (Tenant Information): 0/1=~/ICPT transfer by Group-II signals is not executed

CDN24: OC (Originating Category): 0/1=~/Originating Category Information is used (**Note 4**)

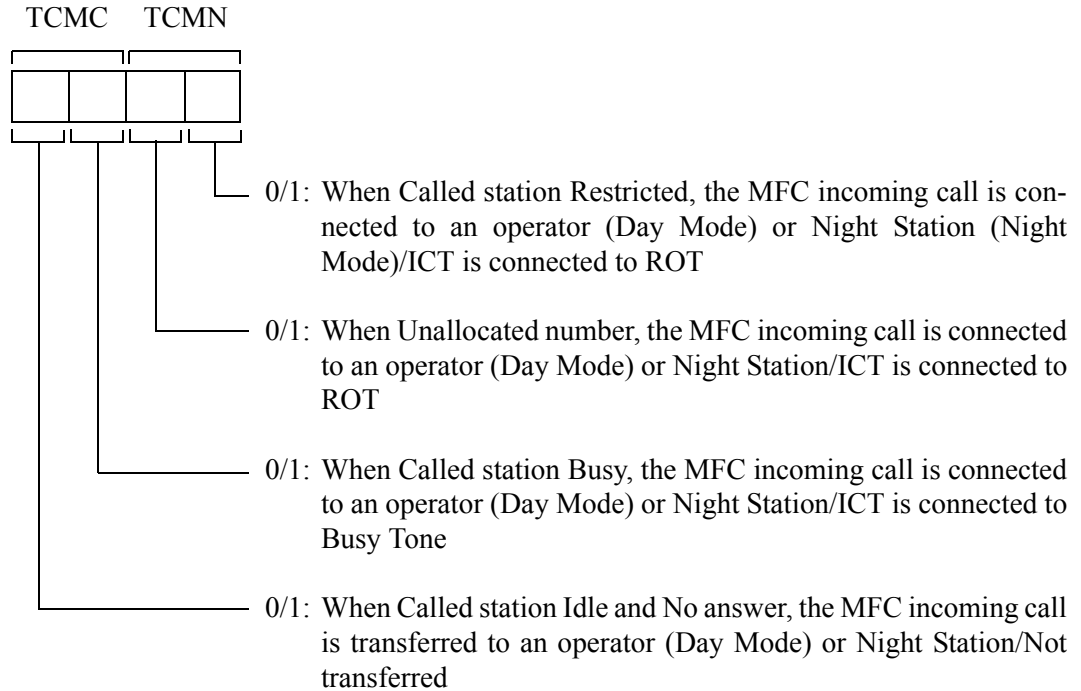
OC=0	When reception of Address Signals is complete, the Telephony Server finishes signal exchange.
OC=1	When reception of Address Signals is complete, the Telephony Server is placed into the next status to receive Group-II Signals.

CDN50: DPLY (Caller ID display over CCIS): 0/1=Disabled/Enabled (**Note 5**)

Note 4: Assign OC=1 in Brazil, Mexico and Kuwait.

Note 5: Up to 8 digits of a Caller ID can be shown on the display.

Assign CDN71: TCMC and CDN70: TCMN in BRAZIL. (TCMC and TCMN are used in BRAZIL only.)



Adjust the following timer value, if necessary.

CDN72 MFSP (OGIDG): Originating MFC Forward Signal Send Inter Digit Timer
 CDN73 KPST (OGSDT): Originating MFC Forward Signal Send Timer
 CDN74 KPPT (OGRVT): Originating MFC Backward Signal Receive Timer
 CDN72 MFSP (ICIDG): Incoming MFC Forward Signal Receive Inter Digit Timer
 CDN80 MPTM (ICSdT): Incoming MFC Backward Signal Send Timer
 CDN81 LPTM (ICRVt): Incoming MFC Forward Signal Receive Timer

Input Data	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
CDN																
MFSP (OGIDG)	24.0	5.5	7.0	8.5	10.0	11.5	13.0	14.5	16.0	17.5	20.0	22.0	24.0	26.0	28.0	30.0
KPST (OGSDT)	12.0	5.5	7.0	8.5	10.0	11.5	13.0	14.5	16.0	17.5	20.0	22.0	24.0	26.0	28.0	30.0
KPPT (OGRVT)	12.0	5.5	7.0	8.5	10.0	11.5	13.0	14.5	16.0	17.5	20.0	22.0	24.0	26.0	28.0	30.0
MFSP (ICIDG)	24.0	5.5	7.0	8.5	10.0	11.5	13.0	14.5	16.0	17.5	20.0	22.0	24.0	26.0	28.0	30.0
MPTM (ICSdT)	12.0	5.5	7.0	8.5	10.0	11.5	13.0	14.5	16.0	17.5	20.0	22.0	24.0	26.0	28.0	30.0
LPTM (ICRVt)	12.0	5.5	7.0	8.5	10.0	11.5	13.0	14.5	16.0	17.5	20.0	22.0	24.0	26.0	28.0	30.0

Unit : Second : Default Data

STEP 3: ATRK – Assign MFC Outgoing/Incoming trunks and MFC Receiver (= MFCR) and MFC Sender (= MFCS).

MFCR: RT=916

MFCS: RT=917

The MFC circuit card (= PA-4MFCA-B/PA-4MFCA), which can be used as both MFC Receiver (MFCR) and MFC Sender (MFCS), must be assigned in accordance with one of the following types.

- TYPE 1 - All four circuits are assigned as MFCR. (Assign MFCS on the other MFC circuit card.)
- TYPE 2 - All four circuits are assigned as MFCS. (Assign MFCR on the other MFC circuit card.)
- TYPE 3 - The first two circuits are assigned as MFCR. The remaining two circuits are assigned as MFCS.
- TYPE 4 - The first two circuits are assigned as MFCS. The remaining two circuits are assigned as MFCR.

MFCR·MFCS Channel Allocation on 4MFCA card

TYPE 1	TYPE 2	TYPE 3	TYPE 4
4MFC	4MFC	4MFC	4MFC

Note: In the FCCS system, MFC Register/Sender must be accommodated in each node.

Note: When a station (or attendant) places an MFC call by LCRS, the MFC Sender and Register (or ATT) must be accommodated in the same IMG.

STEP 4: ALRTN– This command is used for the FCCS system. Assign Logical Route Number to the external route for the MFC line.

LGRT: Logical Route Number (1-899)

FPC: Fusion Point Code (1-253)

RT: External Route Number (1-255)

STEP 5: AANI – Assign the following data which specify ANI (Automatic Number Identification).

TN (Tenant): Enter TN number.

TS (Calling Number of Toll max. 8 digits): Do not assign any data.

LS (Calling Number of Local max. 8 digits): Office Code of LS **Note 6**

LDN (Listed Directory Number max. 8 digits): Assign “station number (LDN)” which is to be transmitted as “Calling Number” in ANI information.

Note 6: When only “station number (LDN)” is required as the “Calling Number,” enter “*” or “#” in LS.

STEP 6: AESC – When the number of receiving digits for ANI information is unknown and the signal End of Digit Code (F) is not to be received, assign the maximum number of digits for ANI Information. **Note 7**

TN: Tenant Number

STI: 3 (ANI Pretranslation Data)

DC: First Digit Code

NND: Necessary Number of Digits for ANI Information (Max.30)

Note 7: This data assignment is necessary only for India.

STEP 7: ARTI – Assign the maximum number of digits for G-I signal.
ANI (CDN31): Timing to demand ANI Information

0: There is no ANI demand at Incoming call

1: After receiving 1st digit

2: After receiving 2nd digit

3: After receiving 3rd digit

4: After receiving 4th digit

5: After receiving 5th digit

6: After receiving 6th digit

7: After receiving Called Number

When a call is routed to an MFC line via tandem connection, G-II signal sent to the MFC line can be determined on a route basis. **Note 8**

MFCG2 (CDN43): Calling Party Category **Note 9**

0: Data Transmission only

1: Subscriber without Priority (Normal setting)

Note 8: When a call is originated from a station or Attendant in a CCIS network, G-II signal sent to the MFC line is determined according to the Service Feature Restriction Class of the originating station or Attendant.

Note 9: This data assignment (CDN43) is not necessary for Kuwait, Thailand, Mexico and Indonesia.

STEP 8: ASFC – Assign SFC (Service Feature Restriction Class) of calling parties.

SFI 59: 0/1 = -/No Charge

SFI 60: 0/1 = -/Called Party Release **Note 10**

SFI 91: 0 = Data Transmission only

1 = Subscriber without Priority (Normal setting) **Note 11**

Request ANI Information on a station's SFC basis.

SFI 163: 0/1 = Request/Not Request ANI Information

Note 10: This data is used when Group-B signals are edited. When data is assigned in both SFI 59 and SFI 60, SFI 59 has preference.

Note 11: This data assignment (SFI 91) is not necessary for Kuwait, Thailand, Mexico and Indonesia.

SFI 88	Category of Attendant
SFI 89	
SFI 91	
SFI 92	
SFI 159	

These SFIs are used in combination to specify G-II signal indicating the category of Attendant when an MFC outgoing call is originated from the following status:

- Attendant Console without a held station/trunk
- Attendant Console with a held station
- Attendant Console with a held trunk
- Individual Trunk Access from Attendant Console

As shown in the table below, G-II signal can be set according to the specification of each country.

SFI: 159	SFI:89	SFI: 88	SFI: 92	SFI: 91	GII Signal to be sent
0	–	–	–	0	Subscriber with Priority
0	–	–	–	1	Subscriber without Priority
1	0	0	0	0	Subscriber with Priority
1	0	0	0	1	1
1	0	0	1	0	2
1	0	0	1	1	3
1	0	1	0	0	4
1	0	1	0	1	5
1	0	1	1	0	6
1	0	1	1	1	7
1	1	0	0	0	8
1	1	0	0	1	9
1	1	0	1	0	A (10)
1	1	0	1	1	B (11)
1	1	1	0	0	C (12)
1	1	1	0	1	D (13)
1	1	1	1	0	E (14)
1	1	1	1	1	F (15)

STEP 9: ATNR – Assign tenant restriction data for MFC line.

OGTN: Originating Tenant **Note 12**

TMTN: Terminating Tenant **Note 12**

TRI: 7 (Routing of incoming call to a station)

RES: 1 (Allowed)

Note 12: The applicable tenant number (TN) range is designated by the ASYD command, SYS1, INDEX 8.

3. SMFC SIGNAL INTERFACE FOR INDONESIA

This section explains data assignment procedure for Indonesia SMFC Signal Interface.

STEP 1: ASYD/ASYDN –Assign appropriate data in the following indexes related to MFC signaling.

Note 1

Note 1: ASYDN command is used in the FCCS system. When the same system data is assigned to all nodes, use ASYDN command. ASYDN command takes precedence over ASYD command.

- SYS1, INDEX 64
b0 (Analog/Digital Conversion System): 0/1 = μ -law/A-law
- SYS1, INDEX 125
b0~b3 (Designation of PAD Value): This PAD value is used for adjusting transmission level of MFC Sender (MFCS).

PAD Value Table

Input Data	PAD Value (db)	Input Data	PAD Value (db)
0	0	4	-8
1	-2	5	-10
2	-4	6	-11.5
3	-6	7	-14

b4 ~ b7 (Type of MFC): 8 (Indonesia (SMFC))

STEP 2: ARTD/ARTDN –Assign Route Data for MFC lines paying attention to the following parameters.

Note 2

Note 2: ARTDN command is used for the FCCS system.

CDN1: OSGS (Outgoing Signal Interface): 2 (Second Dial Tone)

CDN2: ONSG (Outgoing Select Signal): 10 (MFC)

CDN3: ISGS (Incoming Signal Interface): 2 (Second Dial Tone)

CDN4: INSG (Incoming Select Signal): 10 (MFC)

CDN19: ANI (Automatic Number Identification): 0/1=~/In Service

CDN23: TR (Tenant Information): 0/1=~/ICPT transfer by Group-II signal is not executed

CDN24: OC (Originating Category): 0/1=~/Originating Category Information is used

OC=0	When reception of Address Signal is complete, the Telephony Server finishes signal exchange.
OC=1	When reception of Address Signal is complete, the Telephony Server is placed into the next status to receive Group-II Signals.

CDN50: DPLY (Caller ID display over CCIS): 0/1=Disabled/Enabled (**Note 3**)

Note 3: Up to 8 digits of a Caller ID can be shown on the display.

STEP 3: ATRK – Assign MFC Outgoing/Incoming trunks, MFC Receiver (MFCR) and MFC Sender (MFCS).

MFCR: RT=916

MFCS: RT=917

The MFC circuit card (PA-4MFCA-B/PA-4MFCA), which can be used as both MFCR and MFCS, must be assigned in accordance with one of the following types:

- TYPE 1 - All four circuits are assigned as MFCR. (Assign MFCS on the other MFC circuit card.)
- TYPE 2 - All four circuits are assigned as MFCS. (Assign MFCR on the other MFC circuit card.)
- TYPE 3 - The first two circuits are assigned as MFCR. The remaining two circuits are assigned as MFCS.
- TYPE 4 - The first two circuits are assigned as MFCS. The remaining two circuits are assigned as MFCR.

MFCR·MFCS Channel Allocation on 4MFCA card

TYPE 1	TYPE 2	TYPE 3	TYPE 4
4MFC	4MFC	4MFC	4MFC

STEP 4: ALRTN– This command is used for the FCCS system. Assign Logical Route Number to the external route for the MFC line.

LGRT: Logical Route Number (1-899)

FPC: Fusion Point Code (1-253)

RT: External Route Number (1-255)

STEP 5: AAND– Assign the following data which specify ANI (Automatic Number Identification) information.

RT: Route Number

AT: 0 (Station Outgoing)

CC: 0 (Main Central)

KT: 0 (OFF)

SKIP: 0
ADD: Office Code to be Added (1-10)
DC: Office Code (for the number of digits assigned in parameter ADD)

STEP 6: ARTI – Assign the maximum number of digits for G-I signal.
ANI (CDN26): Timing to demand ANI Information

0: There is no ANI demand at Incoming call
1: After receiving 1st digit
2: After receiving 2nd digit
3: After receiving 3rd digit
4: After receiving 4th digit
5: After receiving 5th digit
6: After receiving 6th digit
7: After receiving Called Number

STEP 7: ASFC – Assign SFC (Service Feature Restriction Class) of calling parties.

SFI 59: 0/1 = -/No Charge
SFI 60: 0/1 = -/Called Party Release **Note 4**

Note 4: This data is used when Group-B signals are edited. When data is assigned in both SFI 59 and SFI 60, SFI 59 has preference.

STEP 8: ATNR – Assign tenant restriction data for MFC line.

OGTN: Originating Tenant
TMTN: Terminating Tenant
TRI: 7 (Routing of incoming call to a station)
RES: 1 (Allowed)

4. SERVICE FEATURES

The section explains the following service features related to MFC incoming calls.

- (1) When an MFC DID incoming call is terminated, the system requests ANI (Automatic Number Identification) information and displays the received ANI number on the Desktop terminal LCD. The ANI number can also be output to SMDR (Next Page).
- (2) When an MFC DID incoming call is terminated to Attendant or a UCD station, ANI information received from the opposite office can be output to Message Center Interface (MCI).
- (3) When a called station is in one of the following conditions,
 - Busy
 - Restricted from connection
 - Dead number
 - In make-busy state
 - CALL FORWARDING - DON'T ANSWER[C-3] is set to the station

the MFC DID incoming call is transferred to the predesignated Attendant or Night Transfer Station in the same tenant as the called station.

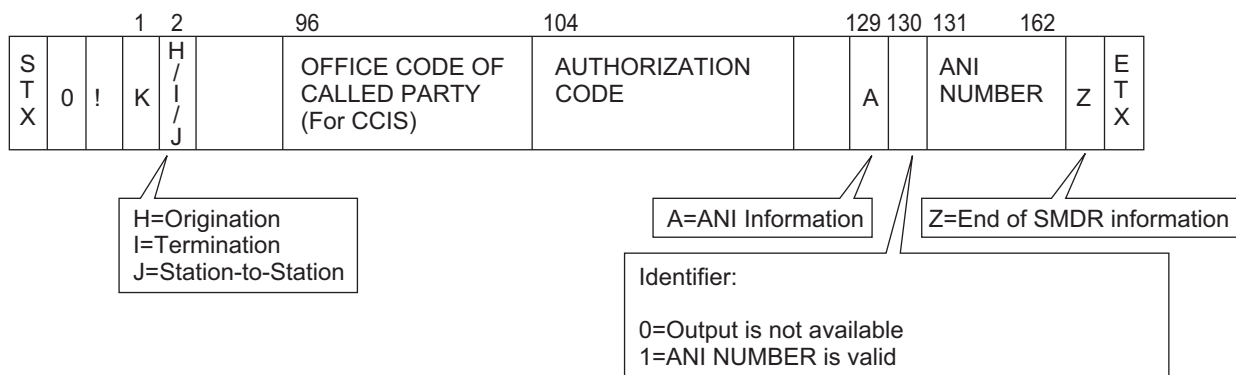
- (4) When an MFC incoming call is terminated to an OAI terminal (Desktop terminal), ANI information received from the opposite office is sent to the OAI computer via Interface Processor (IP) by means of SMFN facility.
- (5) When an MFC incoming call is terminated to an ACD pilot number, the call is handled in the same way as the ACD incoming call from ordinary C.O./Tie line.
- (6) When the system receives GII-7 signal from the MFC Public Exchange, the MFC DID incoming call terminates to the station designated by G-I signal. This feature is available in Malaysia only.
- (7) When an MFC incoming call is terminated, tandem connection to MFC line can be performed by the following services.
 - CALL FORWARDING - ALL CALLS - OUTSIDE [C-28]
 - CALL FORWARDING - BUSY LINE - OUTSIDE [C-60]

- (8) When an MFC DID incoming call is terminated, the system requests ANI (Automatic Number Identification) information and displays the received ANI number on the Desktop terminal LCD. The ANI number can also be output to SMDR.

- (a) Operating Procedure: This Page
- (b) Service Conditions: This Page
- (c) Programming: page 135

- (a) No manual operation is required for this feature.
- (b) Service conditions for this feature are shown below.

- When ANI information is to be output to SMDR, the following expanded SMDR format must be used.

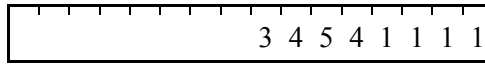


- The maximum number of digits for ANI information is as follows:
 - Category: 1 digit
 - Calling number: 31 digits
- However, when an MFC-DID incoming call is terminated via CCIS line, the condition changes as shown below:
 - Category: None
 - Calling number: 8 digits (When ARTD, parameter CDN98: CI is assigned as "0" at the CCIS originating side)
 - 16 digits (When ARTD, parameter CDN98: CI is assigned as "1" at the CCIS originating side)
- The system starts requesting ANI information when a called number has been received. The maximum necessary number of digits for receiving a called number is assigned by ARTI command.
- Category number is not displayed on the Desktop terminal LCD.

- In the case of Desktop terminal 1-line LCD (16-digit display), the calling number is displayed as shown below.

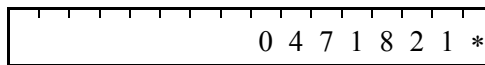
When the received calling number is 8 digits or less:

Ex. “3454-1111” (8 digits) is received



When the received calling number is 9 digits or more:

Ex. “0471-82-1111” (10 digits) is received

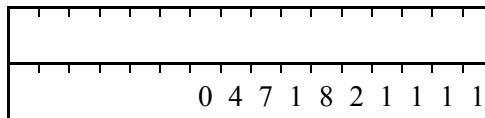


“*” indicates the overflow of digits.

- In the case of Desktop terminal 2-line LCD (16-digit display), the calling number is displayed as shown below.

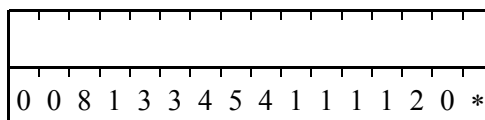
When the received calling number is 16 digits or less:

Ex. “0471-82-1111” (10 digits) is received



When the received calling number is 17 digits or more:

Ex. “0081-3-3454-1111-2000” (17 digits) is received

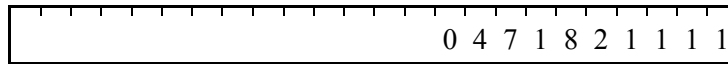


“*” indicates the overflow of digits.

- In the case of Desktop terminal 3-line LCD (24-digit display), the calling number is displayed as shown below.

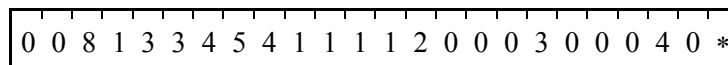
When the received calling number is 24 digits or less:

Ex. “0471-82-1111” (10 digits) is received



When the received calling number is 25 digits or more:

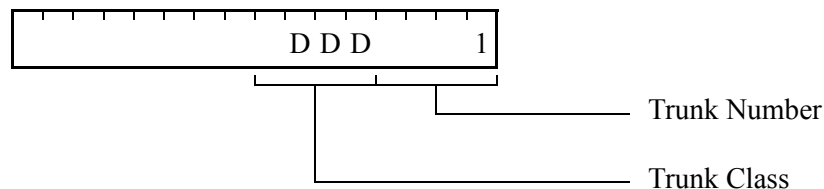
Ex. “0081-3-3454-1111-2000-3000-4000” (25 digits) is received



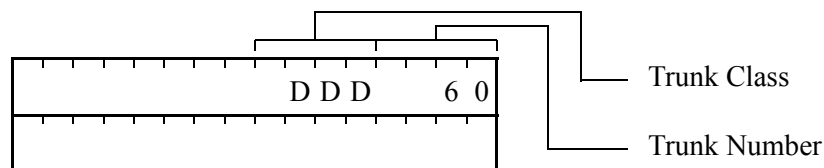
“*” indicates the overflow of digits.

When ANI Information is not received, Trunk Class is displayed.

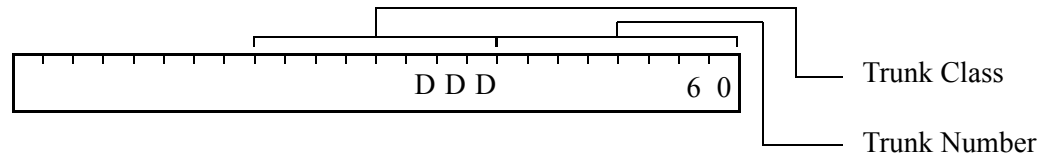
In the case of Desktop terminal 1-line LCD (16-digit display):



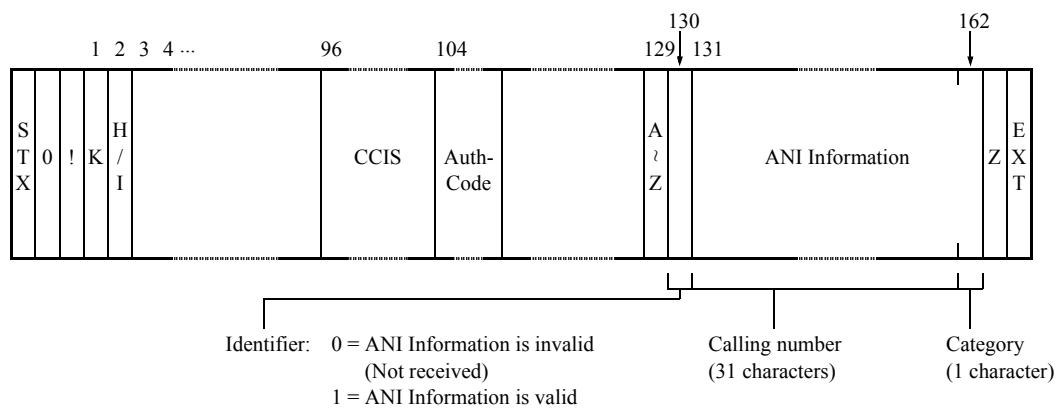
In the case of Desktop terminal 2-line LCD (16-digit display):



In the case of Desktop terminal 3-line LCD (24-digit display):

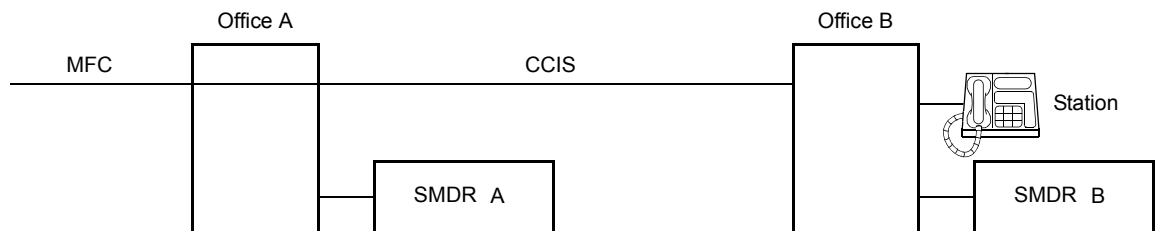


- ANI information can be displayed even if the incoming call is terminated via tandem connection using MFC tie line/CCIS line.
- SMDR output format used for this feature is shown below:



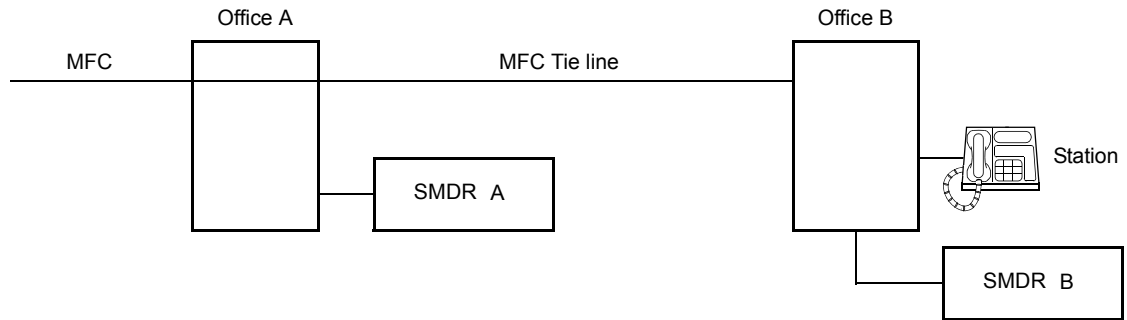
When ANI information is not received, no data is output to ANI information area.

- When an MFC incoming call is terminated via CCIS line:

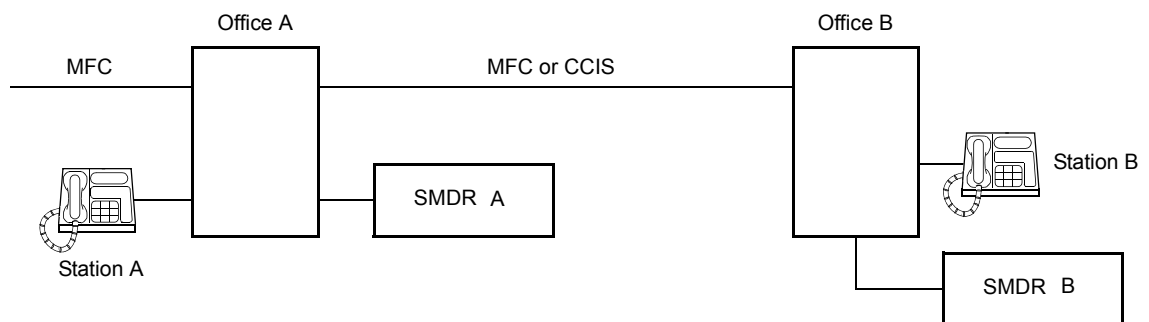


- ANI information is output to SMDR A as billing information for incoming call, and for tandem connection.
- ANI information from the MFC line is output to SMDR B as billing information for incoming call. However, a maximum of 16 digits can be displayed.

- When an MFC incoming call is terminated via MFC tie line:



- ANI information is output to SMDR A as billing information for incoming call, and for tandem connection.
 - ANI information from the MFC line is output to SMDR B as billing information for incoming call.
- When an MFC incoming call is terminated to Station A in Office A, and the call is transferred to Station B in Office B:



- ANI information from the MFC line is output to SMDR A .
 - ANI information of Station A is output to SMDR B .
 - When a call is transferred via CCIS line, a maximum of 16 digits can be displayed on the Desktop terminal LCD.
- When using this feature, NAME DISPLAY - SYSTEM - CCIS[N-37] cannot be activated.
- To edit ANI information, SMDR apparatus must support Expanded SMDR format.
- When the identifier of ANI information is 2, 3, 4 or 5, information received from the opposite office is output.
- When an MFC incoming call is routed to a CCIS line via tandem connection, and SMDR is in service at the destination office, a maximum of 16 digits are output as ANI information. However, ANI information is output only when the identifier of ANI information is 1.
- Expanded SMDR format is available for Centralized Billing-CCIS. However, information in the expanded area is not output when the expanded format is not supported at the centralized node.

(c) Data assignment procedure for this service is shown below:

STEP 1: ASYD - Assign the system data related to MFC and Desktop terminal LCD indication. When ANI information is to be output to SMDR, assign the following system data in addition to the ordinary data assignment for SMDR.
 System Data 1, Index 288, Bit 5:Expanded SMDR Output for SMDR A Apparatus.
 0/1=Out/In Service.
 System Data 1, Index 290, Bit 5:Expanded SMDR Output for SMDR B Apparatus.
 0/1=Out/In Service.
 System Data 1, Index 292, Bit 5:Expanded SMDR Output for SMDR C Apparatus.
 0/1=Out/In Service.
 System Data 1, Index 294, Bit 5:Expanded SMDR Output for SMDR D Apparatus.
 0/1=Out/In Service.
 System Data 1, Index 296, Bit 0:Output of Calling Number (ANI information)
 0/1=Out/In Service. Assign data "1".
 System Data 1, Index 300, Bit 0. 0/1=-/Billing information is sent to the Main Node in Expanded SMDR format in the case of Centralized Billing-CCIS.

STEP 2: ARTD - Assign route class data for MFC lines.
 RT: Route number of incoming MFC line
 CDN50: DPLY: 1 (Received ANI information is displayed on the Dterm LCD.
Note 1)

- When ANI information is to be output to SMDR:
 CDN10: SMDR:1

Note 1: Up to 8 digits of a Caller ID can be shown on the display.

STEP 3: ARTI - Assign trunk application data for MFC lines.
 RT: Route number of incoming MFC line
 ANI: Timing to demand ANI Information
 0: There is no ANI information at Incoming call
 1: After receiving 1st digit
 2: After receiving 2nd digit
 3: After receiving 3rd digit
 4: After receiving 4th digit
 5: After receiving 5th digit
 6: After receiving 6th digit
 7: After receiving Called Number

STEP 4: ARTK - Assign trunk data for the MFC line and MFC sender/receiver.

STEP 5: ASFC - Assign Service Feature Restriction Class for each station. When ANI information is to be output to SMDR, assign a Service Feature Restriction Class that allows SFI14 to stations allowed SMDR.

(9) When an MFC DID incoming call is terminated to Attendant or a UCD station, ANI information received from the opposite office can be output to Message Center Interface (MCI).

- (a) Operating Procedure : This Page
- (b) Service Conditions : This Page
- (c) Programming : page 142

- (a) No manual operation is required for this feature.
- (b) Service conditions for this feature are shown below.

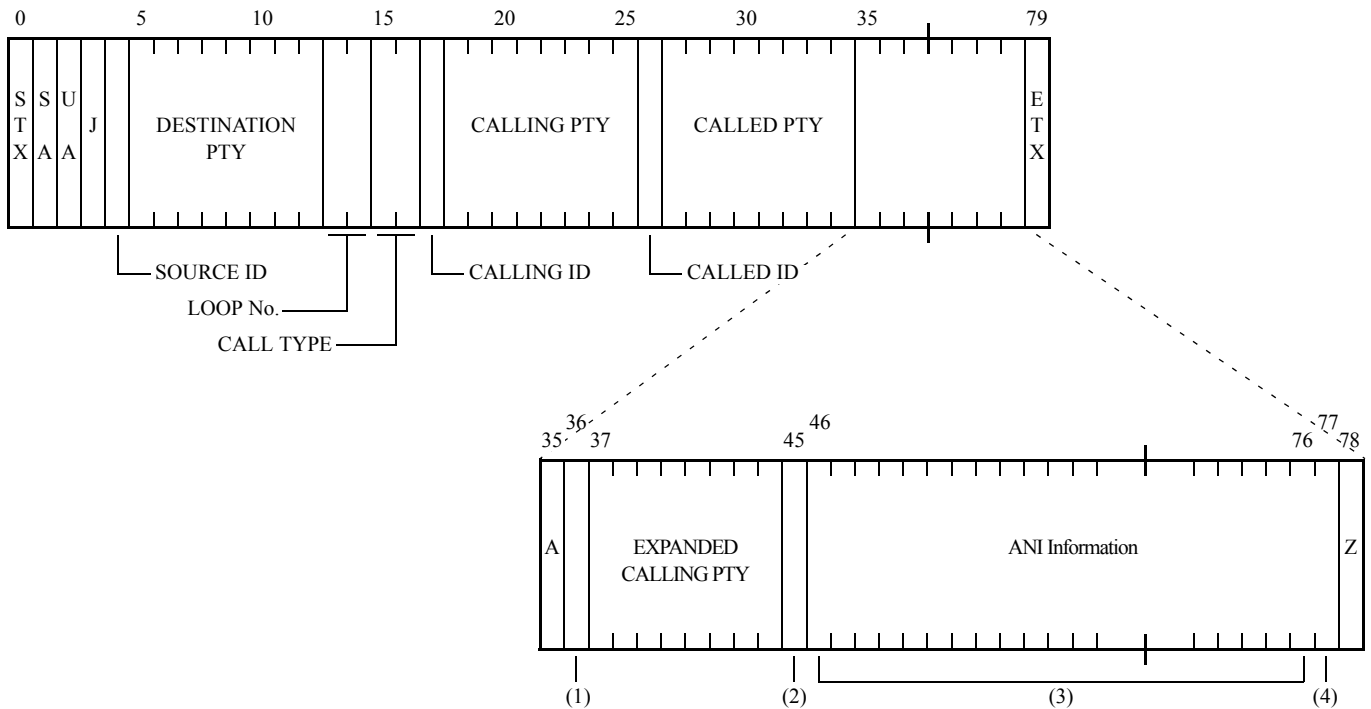
- The maximum number of digits for ANI information is as follows:

Category: 1 digit
 Calling number: 31 digits

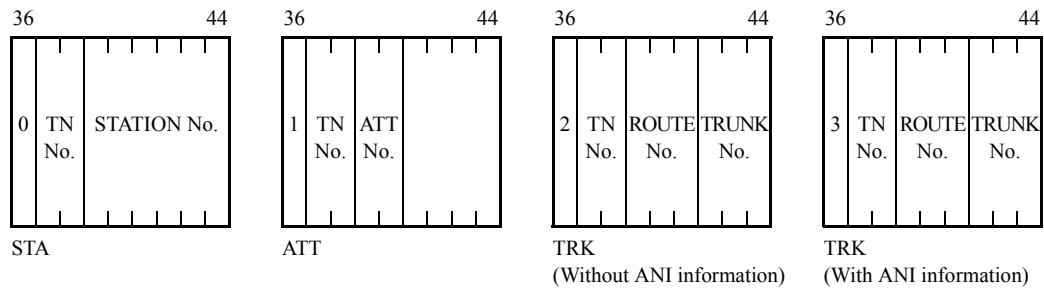
- However, when an MFC DID incoming call is terminated via CCIS line, the condition changes as shown below:

Category: None
 Calling number: 8 digits (When ARTD, parameter CDN98: CI is assigned as "0" at the CCIS originating side)
 16 digits (When ARTD, parameter CDN98: CI is assigned as "1" at the CCIS originating side)

- MCI output format used for this feature is shown below.

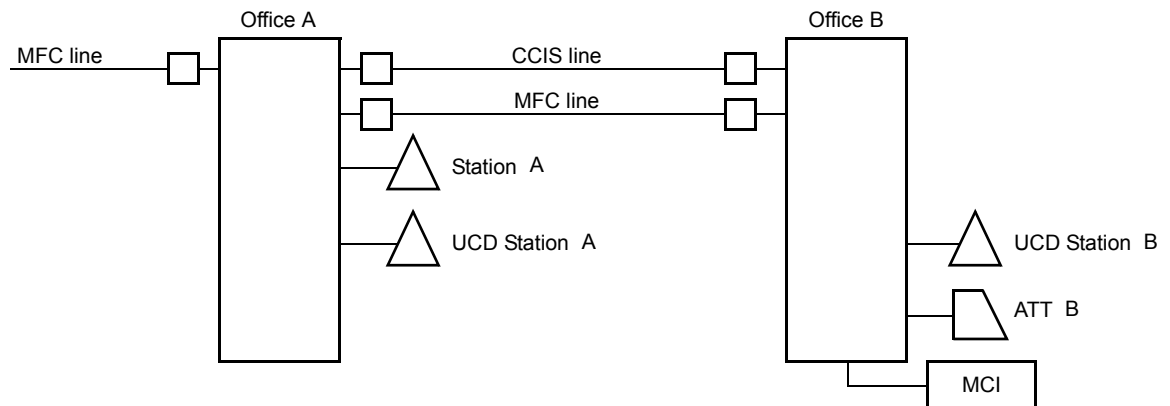


As shown below, the contents of EXPANDED CALLING PTY vary depending upon the type of EXPANDED CALLING ID.



When ANI Information is not received, no data is output to ANI information area.

- As an example, the following network is used for explaining MCI output format.

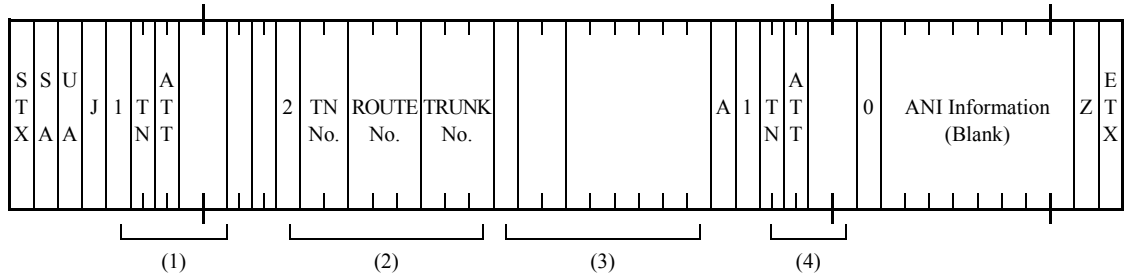


MCI output format varies depending on the type of call termination.

- | | |
|---|-----------|
| 1 : Station A → ATT B : | Next Page |
| 2 : Station A → UCD Station B : | Next Page |
| 3 : MFC → ATT B (With ANI Information) : | Next Page |
| 4 : MFC → ATT B (Without ANI Information) : | page 139 |
| 5 : MFC → UCD Station B (With ANI Information) : | page 139 |
| 6 : MFC → UCD Station B (Without ANI Information) : | page 139 |
| 7 : Station A → CCIS → ATT B : | page 140 |
| 8 : Station A → CCIS → UCD Station B : | page 140 |
| 9 : MFC → CCIS → ATT B (With ANI Information) : | page 140 |
| 10 : MFC → CCIS → ATT B (Without ANI Information) : | page 141 |
| 11 : MFC → CCIS → UCD Station B (With ANI Information) : | page 141 |
| 12 : MFC → CCIS → UCD Station B (Without ANI Information) : | page 141 |

10 : MFC → CCIS → ATT B (Without ANI Information)

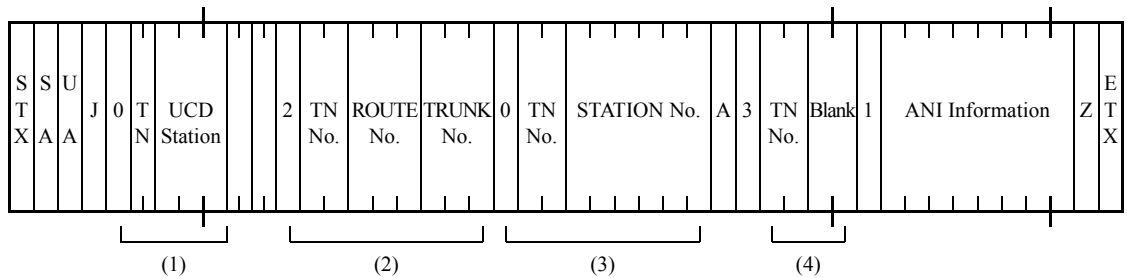
The following message is sent to MCI.



- (1) SOURCE (ATT B)
- (2) CALLING (Route/Trunk number of CCIS line)
- (3) CALLED (Blank)
- (4) EXPANDED CALLING

11 : MFC → CCIS → UCD Station B (With ANI Information)

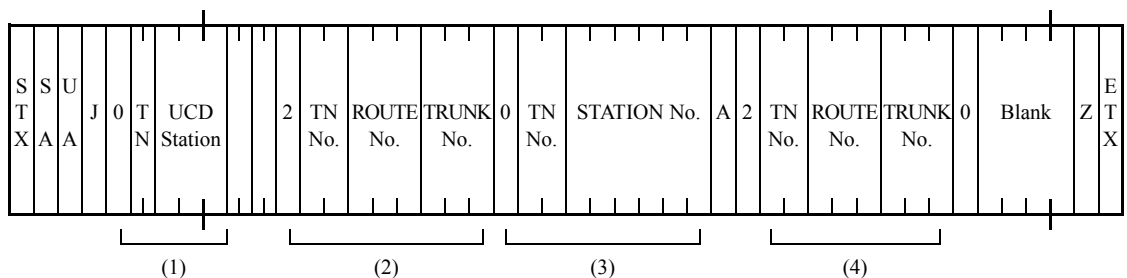
The following message is sent to MCI.



- (1) SOURCE (UCD Station B)
- (2) CALLING (Route/Trunk number of CCIS line)
- (3) CALLED (UCD Station B)
- (4) EXPANDED CALLING

12 : MFC → CCIS → UCD Station B (Without ANI Information)

The following message is sent to MCI.



- (1) SOURCE (UCD Station B)
- (2) CALLING (Route/Trunk number of CCIS line)
- (3) CALLED (UCD Station B)
- (4) EXPANDED CALLING (Route/Trunk number of MFC trunk in Office A)

(c) Data assignment procedure for this service is shown below:

ASYD - Assign the system data related to MFC and MCI. In addition, assign the following system data for this service:

SYS1, INDEX 400, Bit 2. 0/1 = -/ANI information is output to MCI. Assign 1.

(10) When a called station is in one of the following conditions,

- Busy
- Restricted from connection
- Dead number
- In make-busy state
- CALL FORWARDING - DON'T ANSWER[C-3] is set to the station

the MFC DID incoming call is transferred to the predesignated Attendant or Night Transfer Station in the same tenant as the called station.

- (a) Operating Procedure : This Page
- (b) Service Conditions : This Page
- (c) Programming : page 146

(a) No manual operation is required for this feature.

(b) Service conditions for this feature are shown below.

- Transfer destination varies depending upon the system mode, as shown below.

When the system is in Day mode: Attendant in the same tenant as the called station

When the system is in Night mode: Night Transfer Station in the same tenant as the called station

- Conditions for connection vary depending upon the data assignment and the called party status, as shown below.

1 : ASYD command, SYS1, INDEX 400, Bit 4 = 0 (This service is not available)

ARTD command, Parameter CDN23: TR = 0 (CALL FORWARDING - INTERCEPT/ANNOUNCEMENT by GII signal is available)

Called party status

Conditions for connection

Idle (or No answer)

- The system sends B1 signal.
- When the called station does not answer, the call is transferred to Attendant or Night Transfer Station in the same tenant as the incoming trunk by means of CALL FORWARDING - DON'T ANSWER.

Busy

- The system sends B1 signal.
- The call is transferred to Attendant or Night Transfer Station in the same tenant as the incoming trunk by means of CALL FORWARDING - BUSY LINE.

Restricted from connection/ In make-busy state	• The system sends B1 signal. • The call is transferred to Attendant or Night Transfer Station in the same tenant as the incoming trunk by means of CALL FORWARDING - INTERCEPT/ ANNOUNCEMENT.
Unallocated number (Station not assigned)	• The system sends B1 signal. • The call is transferred to Attendant or Night Transfer Station in the same tenant as the incoming trunk by means of CALL FORWARDING - INTERCEPT/ ANNOUNCEMENT.
Unallocated number (Number not assigned)	• The system sends B4 signal. • Reorder tone is connected to the incoming trunk.
Night Station busy	• The system sends B2 signal. • Busy Tone is connected to the incoming trunk.
G II-3,5,7~10 is received	• The system sends B1 signal. • The call is transferred to Attendant or Night Transfer Station in the same tenant as the incoming trunk by means of CALL FORWARDING - INTERCEPT/ ANNOUNCEMENT.

2 : ASYD command, SYS1, INDEX 400, Bit 4 = 0 (This service is not available)
 ARTD command, Parameter CDN23: TR = 1 (CALL FORWARDING - INTERCEPT/ANNOUNCEMENT by GII signal is not available)

Called party status	Conditions for connection
Idle (or No answer)	• The system sends B1 signal. • Forwarding operation is not executed.
Busy	• The system sends B2 signal. • Busy Tone is connected to the incoming trunk.
Restricted from connection/ In make-busy state	• The system sends B4 signal. • Reorder tone is connected to the incoming trunk.
Unallocated number (Station not assigned)	• The system sends B4 signal. • Reorder tone is connected to the incoming trunk.
Unallocated number (Number not assigned)	• The system sends B4 signal. • Reorder tone is connected to the incoming trunk.
Night Station busy	• The system sends B2 signal. • Busy Tone is connected to the incoming trunk.

Called party status

Conditions for connection

G II-3,5,7~10 is received

- Irrespective of GII signal, the called station is rang after B1 signal is sent.

3 : ASYD, SYS1, INDEX 400, Bit 4 = 1 (This service is available)
 ARTD command, Parameter CDN23: TR = 0 (CALL FORWARDING - INTERCEPT/ANNOUNCEMENT by GII signal is available)

Called party status

Conditions for connection

Idle (or No answer)

- The system sends B1 signal.
- When the called station does not answer, the call is transferred to Attendant or Night Transfer Station in the same tenant as the called station by means of CALL FORWARDING - DON'T ANSWER.

Busy

- The system sends B1 signal.
- The call is transferred to Attendant or Night Transfer Station in the same tenant as the called station by means of CALL FORWARDING - BUSY LINE.

Restricted from connection/
 In make-busy state

- The system sends B1 signal.
- The call is transferred to Attendant or Night Transfer Station in the same tenant as the called station by means of CALL FORWARDING - INTERCEPT/ANNOUNCEMENT.

Unallocated number
 (Station not assigned)

- The system sends B1 signal.
- The call is transferred to Attendant or Night Transfer Station in the same tenant as the called station by means of CALL FORWARDING - INTERCEPT/ANNOUNCEMENT.

Unallocated number
 (Number not assigned)

- The system sends B1 signal.
- The call is transferred to Attendant or Night Transfer Station in the same tenant as the called station by means of CALL FORWARDING - INTERCEPT/ANNOUNCEMENT.

Night Station busy

- The system sends B1 signal.
- The call is in a queue until Night Station becomes idle.

G II-3,5,7~10 is received

- The system sends B1 signal.
- The call is transferred to Attendant or Night Transfer station in the same tenant as the called station by means of CALL FORWARDING - INTERCEPT/ANNOUNCEMENT.

- 4 : ASYD, SYS1, INDEX 400, Bit 4 = 1 (This service is available)
 ARTD command, Parameter CDN23: TR = 1 (CALL FORWARDING INTERCEPT/ANNOUNCEMENT by GII signal is not available)

Called party status	Conditions for connection
Idle (or No answer)	• The system sends B1 signal. • Forwarding operation is not executed.
Busy	• The system sends B2 signal. • Busy Tone is connected to the incoming trunk.
Restricted from connection/ In make-busy state	• The system sends B4 signal. • Reorder tone is connected to the incoming trunk.
Unallocated number (Station not assigned)	• The system sends B7 signal. • Reorder tone is connected to the incoming trunk.
Unallocated number (Number not assigned)	• The system sends B7 signal. • Reorder tone is connected to the incoming trunk.
Night Station busy	• The system returns the status of transferring party. • Busy tone is connected to the incoming trunk.
G II-3,5,7~10 is received	• Irrespective of GII signal, the called station is rang after B1 signal is sent.

- Each Night Transfer feature is given priority in the following order.
 1. This Feature
 2. Night Connection Flexible
 3. LDN Night Connection
 4. Night Connection Outside
 5. Trunk Answer from Any Station Connection
 6. Busy Tone Connection
- Call Forwarding-Don't Answer takes precedence over this feature.

(c) Data assignment procedure for this service is shown below:

STEP 1: ASYD - Assign system data related to MFC incoming call. In addition, assign the following System Data for this service:

System Data 1, Index 400, Bit 4. When the called station is in one of the following conditions:

- Busy
- Restricted from connection
- Dead number
- In make-busy state
- CALL FORWARDING - DON'T ANSWER is set to the station

0/1 = -/The MFC DID incoming call is transferred to the predesignated Attendant or Night Transfer Station in the same tenant as the called station. Assign 1.

STEP 2: ARTD - Assign the route class data (including the Timer value) for the MFC line.

STEP 3: ATRK - Assign trunk data for the MFC line and MFC sender/receiver.

STEP 4: AESC - Assign the transfer destination in the same tenant as the called station.

TN: Tenant Number

STI: 2

TRS: 0 (Transfer Call Data Type - NIGHT)

1 (Transfer Call Data Type - BUSY)

2 (Transfer Call Data Type - NO ANS)

3 (Transfer Call Data Type - ICPT)

(A: Attendant/ S: Station/ T: Trunk)

TYPE: 1 (Attendant)

2 (Station)

3 (Trunk)

DATA: No Data (When TYPE = Attendant)

STN (When TYPE = Station)

ADC (When TYPE = Trunk)

STEP 5: AANI - Assign ANI information data.

STEP 6: ATNR - Assign tenant restriction class data.

STEP 7: ARSC - Assign route restriction class data.

STEP 8: ACFR - Assign the restriction data for Call Forwarding services.

- (11) When an MFC incoming call is terminated to an OAI terminal (Desktop terminal), ANI information received from the opposite office is sent to the OAI computer via Interface Processor (IP) by means of SMFN facility.

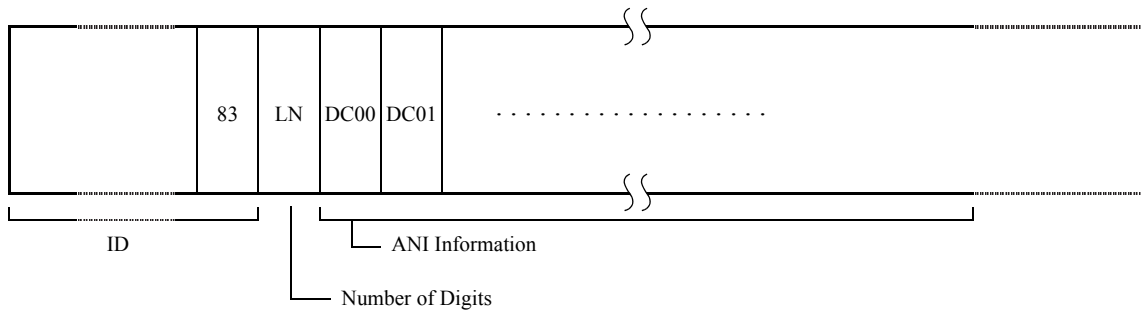
Note 2

Note 2: Data assignment specific to this feature is not required.

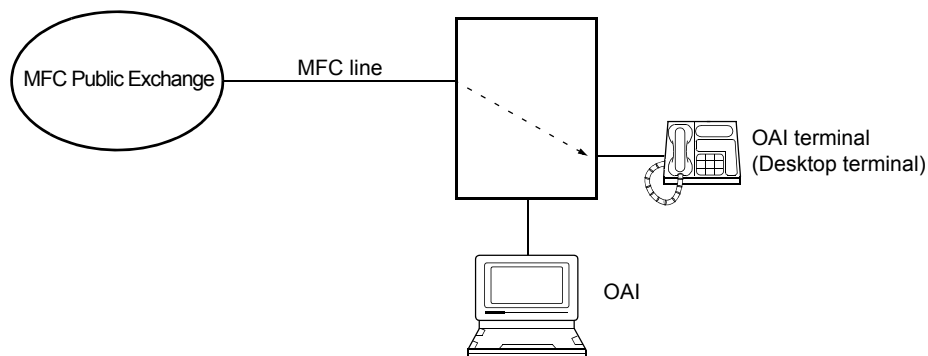
- (a) No manual operation is required for this feature.
 (b) Service conditions for this feature are shown below.

- SMFN facility output format is shown below.

Field Name: additional Inf.-II

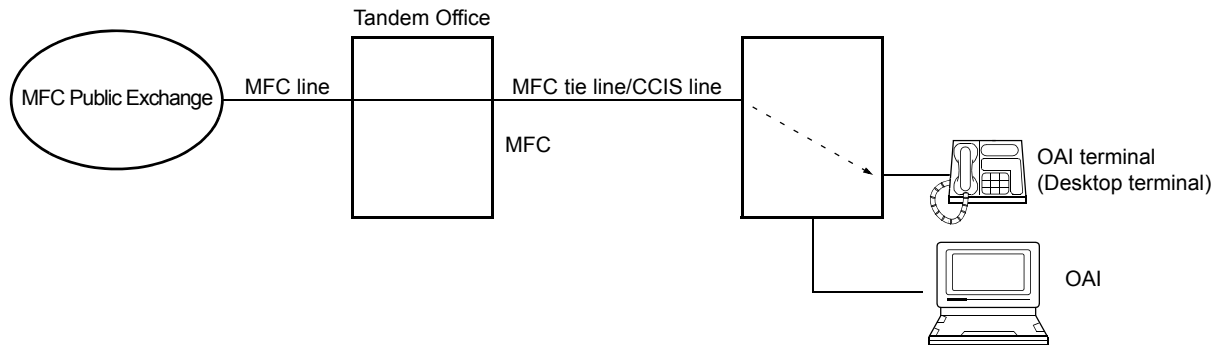


- Received category number is not output to the calling party information area in SMFN facility format.
- ANI information is output at the time when an MFC incoming call is terminated to an OAI terminal, and when the OAI terminal user answers.
- When ANI information is not requested, no data is output to ANI information area in SMFN facility format.
- When a call is terminated from an MFC Public Exchange:



- When an MFC incoming call is terminated to an OAI terminal, and when the OAI terminal user answers, ANI information is output to ANI information area in SMFN facility format.
- As an ANI information, a maximum of 31 digits can be output.

- Category information (1digit) is not output.
- When a call is terminated from an MFC Public Exchange via MFC tie line or CCIS line:



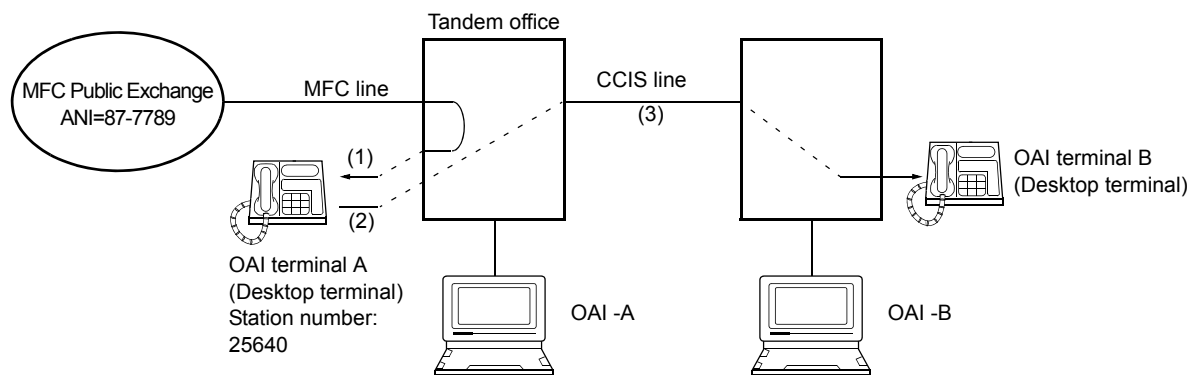
- When an MFC incoming call is terminated to an OAI terminal, and when the OAI terminal user answers, ANI information is output to ANI information area in SMFN facility format.
- As an ANI information, a maximum of 31 digits can be output when the call is terminated via MFC tie line.
- However, when the call is terminated via CCIS line, the condition changes as shown below.

Category: None

Calling number: 8digits (When ARTD, parameter CI is assigned as “0” at the CCIS originating side)

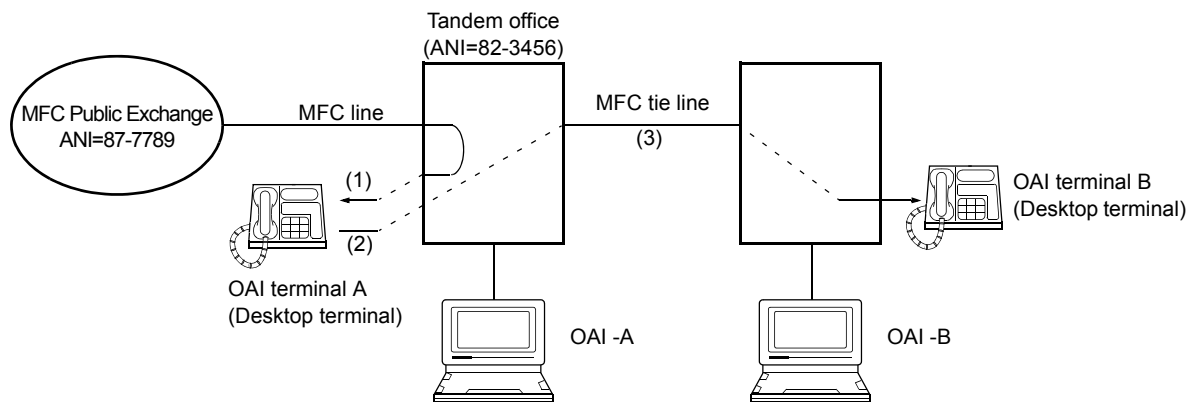
16digits (When ARTD, parameter CI is assigned as “1” at the CCIS originating side)

- When a call terminated from an MFC Public Exchange is transferred to an OAI terminal in another office via CCIS line:



- (1) A call is terminated from the MFC Public Exchange to the OAI terminal A.
 - a. When the MFC incoming call is terminated to the OAI terminal A, and when the user answers, “87-7789” received from MFC Public Exchange is output to ANI information area in SMFN facility format.
 - b. A maximum of 31 digits can be output.
- (2) The call is transferred to OAI terminal B via CCIS line.

- a. When the MFC incoming call is terminated to the OAI terminal B, and when the user answers, "25640" (station number of OAI terminal A) is output to ANI information area in SMFN facility format.
- (3) The OAI terminal B answers.
 - a. When the OAI terminal B answers after the OAI terminal A goes on-hook: "87-7789" received from MFC Public Exchange is output to ANI information area in SMFN facility format.
 - b. When the OAI terminal B answers before the OAI terminal A goes on-hook: "25640" (station number of OAI terminal A) is output to ANI information area in SMFN facility format.
- When a call terminated from an MFC Public Exchange is transferred to an OAI terminal in another office via MFC tie line:



- (1) A call is terminated from the MFC Public Exchange to the OAI terminal A.
 - a. When the MFC incoming call is terminated to the OAI terminal A, and when the user answers, "87-7789" received from MFC Public Exchange is output to ANI information area in SMFN facility format.
 - b. A maximum of 31 digits can be output.
- (2) The call is transferred to OAI terminal B via CCIS line.
 - a. When the MFC incoming call is terminated to the OAI terminal B, "82-3456" (ANI information assigned at the tandem office) is output to ANI information area in SMFN facility format.
 - b. A maximum of 31 digits can be output.
- (3) The OAI terminal B answers.
 - a. When the OAI terminal B answers after the OAI terminal A goes on-hook: "82-3456" (ANI information assigned at the tandem office) is output to ANI information area in SMFN facility format.
 - b. When the OAI terminal B answers before the OAI terminal A goes on-hook: "82-3456" (ANI information assigned at the tandem office) is output to ANI information area in SMFN facility format.
 - c. A maximum of 31 digits can be output.

- (12) When an MFC incoming call is terminated to an ACD pilot number, the call is handled in the same way as the ACD incoming call from ordinary C.O./Tie line.
- (a) No manual operation is required for this feature.
 - (b) Service conditions for this feature are shown below.
 - Transferring an ACD incoming call to an MFC line is available only when an ACD position transfers the call (i.e. Call Control Vector (CCV) cannot be used.).
 - This service is available in the following countries:
 - Argentina
 - Australia
 - Brazil
 - Chile
 - Colombia
 - Korea
 - Mexico
 - Singapore
 - Thailand
 - Venezuela
 - CCITT-R2 (NEC standard) / Kuwait
 - (c) Data assignment specific to this feature is not required.
- (13) When the system receives GII-7 signal from the MFC Public Exchange, the MFC DID incoming call terminates to the station designated by G-I signal. This feature is available in Malaysia only.
- (a) No manual operation is required for this feature.
 - (b) This service is based on the MFC signaling system for Singapore.
 - (c) Data assignment procedure for this service is shown below.

ASYD - System Data 1, Index 125, Bit 4 through 7. MFC Signaling System. Assign data as shown below:

	Bit4	Bit5	Bit6	Bit7
Data	1	0	1	0

System Data 1, Index 400, Bit 3. 0/1 = -/When the MFC Public Exchange sends G-II signal, the MFC DID call is terminated to the station designated by G-I signal.

(14) When MFC Incoming call is terminated to the station that is assigned to transfer to MFC line by the following services.

- CALL FORWARDING - ALL CALLS - OUTSIDE [C-28]
- CALL FORWARDING - BUSY LINE - OUTSIDE [C-60]

- (a) Assign the following Route Class Data for the Incoming Trunk.
CDN:24 OC=1
- (b) Outgoing Trunk must be terminated to MFC line first. When MFC line is assigned as second route or more by Outgoing Route Selection Pattern, this service is not available.
- (c) Call Forwarding is restricted when Outgoing Trunk or MFC Sender is busy. Incoming Trunk hears Re-order Tone.
 - In this case, Outgoing Pattern Routing and the services related to Busy Line (for example: INTER OFFICE OFF-HOOK QUEUING [I-11]) are restricted.
 - Above condition is applied when Outgoing Trunk is terminated to MFC line first. When other than MFC line is assigned as second route, Outgoing Trunk can be terminated to the second route.
 - If Outgoing Trunk cannot originate to any route, INTER OFFICE OFF-HOOK QUEUING [I-11] with the service related to Busy Line is not available. Incoming Trunk hears Reorder Tone.
- (d) Call Forwarding to the MFC line is usually in LCR or LCRS. However, tandem connection must be LCR in this service.
- (e) MFC signaling method can be assigned in ASYD command. (SYS 1, INDEX125 bit4-7)

Note: This service is available except for China and Indonesia.

- (f) OVERSEAS COLLECT CALL ISDN DIVERSION [O-40] service has priority when MFC signaling method is Singapore setting.

Note: Above service is available when the following Route Class Data for the Outgoing Trunk is assigned.
CDN:23 TR=1

- (g) MFC signal (G-II/ANI) are dealt with as described below. (ASYD, SYS 1, INDEX 403, bit3=0/1)
 - MFC signaling method is generated at the Self Node. (bit3=0)
 - The signal received from the originating office is passed through transparently. (bit3=1)

Note: When the signal cannot be received although the ANI signal is assigned to be passed through, LS or LDN that is assigned at tandem office in AANI command is sent as ANI.

- (h) MFC signal (G-B) are dealt with as described below. (ASYD, SYS 1, INDEX 403, bit3=0/1)
 - MFC signaling method is generated at the Self Node. (bit3=0)
 - The signal received from the originating office is passed through transparently. (bit3=1)

Note: When the signaling method is to be generated at the Self Node, "Subscriber Line free (charge)" is returned.

- (i) MFC sender must be accommodated to the node to which Incoming Trunk is accommodated in the FCCS network.
- (j) SPLIT CALL FORWARDING [S-99] is available in this service.
- (k) Data assignment procedure for this service is described below.

STEP 1: ASYD - Billing information when originating a call using MFC signaling method.
System Data 1, Index 403, bit 2
0/1=When receiving a call, output the billing information or not.

STEP 2: ASYD - Assign this data when using Call Forwarding - Outside in this service.
System Data 1, Index 411, bit 3
0=MFC signaling method is generated at the Self Node.
1=The signal received from the originating office is passed through transparently.

STEP 3: ARTD - Originating Category Information for the MFC Incoming Route.
CDN: 24 OC=1 Originating Category Information is used.

STEP 4: ARTD - OVERSEAS COLLECT CALL ISDN DIVERSION [O-40] for MFC Outgoing Route
CDN: 23 TR=0/1 Above service is available or not.

STEP 5: ARRC - Release the restriction on following connections.

- MFC Incoming Trunk - MFC Outgoing Trunk
- MFC Incoming Trunk - Dummy Route

ICRT: Incoming Route Number [1-255]

OGRT: Outgoing Route Number [1-255]/Dummy Route Number [1-255]

ARI A-RES: Restriction Data For Alternative Route INDEX-A [0/1]

Tandem connection with an operator/station assistance.

0=Restricted

1=Allowed

ARI D-RES: Restriction Data For Alternative Route INDEX-D [0-2]

Tandem connection without an operator/station assistance

0=Restricted

1=Allowed

2=Toll (Conditional) restriction is required

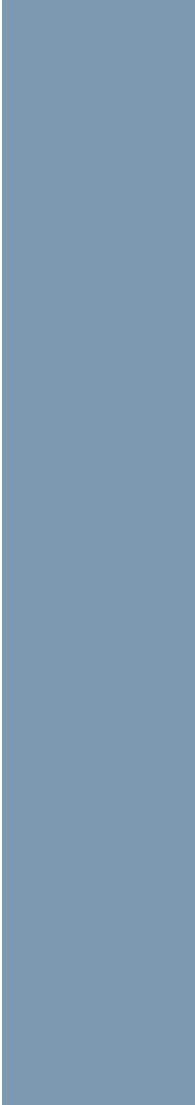
STEP 6: ASTD - Assign the state translation data.
Tandem connection with COT included is allowed. (depending on ARRC)
STM: 0
STS: 2
ST: 1

Note: Assign this parameter when using this service.



CHAPTER 5

INSTALLATION TEST



This chapter explains the installation test to use the MFC Signal Interface. The following two tests are necessary for Trunk and MFC Register/Sender as port connection test.

- Outgoing Trunk (TLT, DTI Card) Connection Test
- Incoming Trunk (TLT, DTI Card) Connection Test

Tests are to be performed on all the circuits of Trunk circuit card and MFC Register/Sender circuit card.

1. OUTGOING TRUNK (TLT, DTI CARD) CONNECTION TEST

Test Outline:

The purpose of this test is to confirm, by setting up an outgoing connection test for each outgoing trunk, that speech can be made and that the call can be released. Outgoing trunks must be tested one at a time using the sequence of Routes and Trunk Numbers assigned at each office.

START

When a C.O. line or Tie Line is not connected with a trunk circuit, temporary cross connections between the Outgoing Trunk being tested and the terminating trunk should be set up on the MDF as a loop-back circuit. **Note 1**

By referring to TLT Test Configuration and DTI Test Configuration, make temporary cross connections on the MDF for a loop-back circuit.

Temporarily assign Office Data from PCPro so that a loop-back connection from the trunk can be established.

Refer to DTI Test Configuration to know the function of the MFC Register and Sender.

Make busy all MFC Register/Sender for Outgoing except one circuit.

On the front of the PA-4MFCA-B/PA-4MFCA circuit card, set the MBR switch to the RIGHT position except one circuit.

When the temporary cross connection is set up, Un-busy (make idle) all MFC Register/Sender for Incoming.

Make busy all Outgoing Trunks.

On the front of the Trunk circuit card, set the MB switch to the RIGHT position, thereby making the trunk busy.

Test the trunk circuits one at a time by establishing access from a station.

Un-busy (make idle) only the trunk to be tested.

The station dials the Access Code of the trunk being tested and the number for the call destination.

The called side answers

The station confirms speech.

The call is released

Make temporary cross connections for the next trunk to be tested

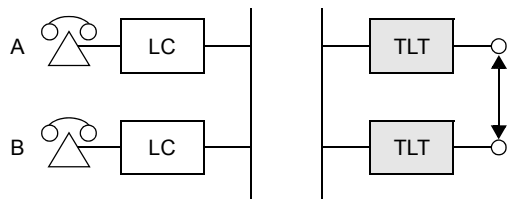
Test another MFC Register/Sender for Outgoing

Restore the temporary connections, temporary Office Data, etc. to the original.

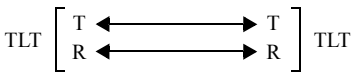
END

Note 1: The test by a loop-back circuit is available when both outgoing connection and the incoming connection are used.

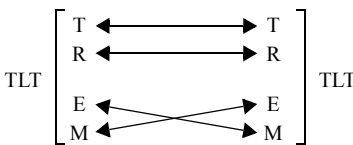
TLT Test Configuration



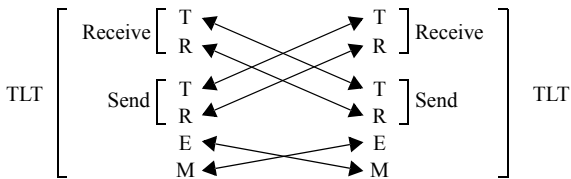
- Set up a loop-back connection between the TLT (Tie Line Trunk) to be tested and another TLT.
- If the TLT is a Loop Dialing System, connect the related leads as shown below.



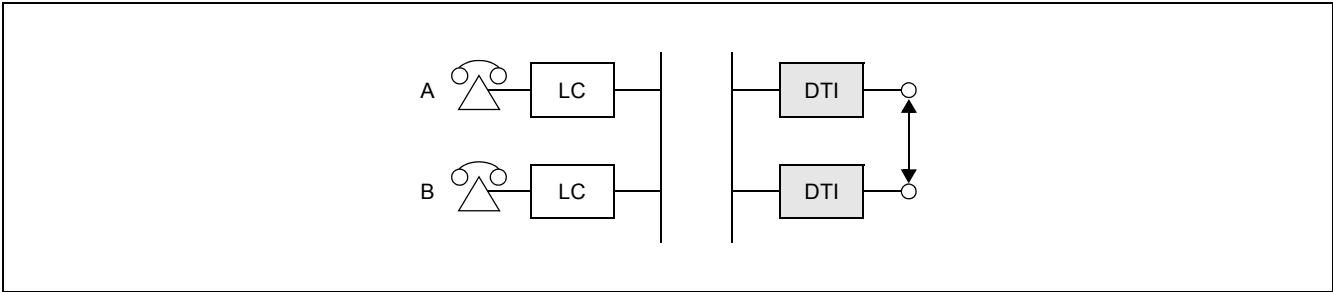
- If the TLT is a 2W E&M System, connect the related leads as shown below.



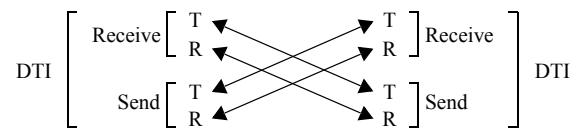
- If the TLT is a 4W E&M System, connect the related leads as shown below.



DTI Test Configuration

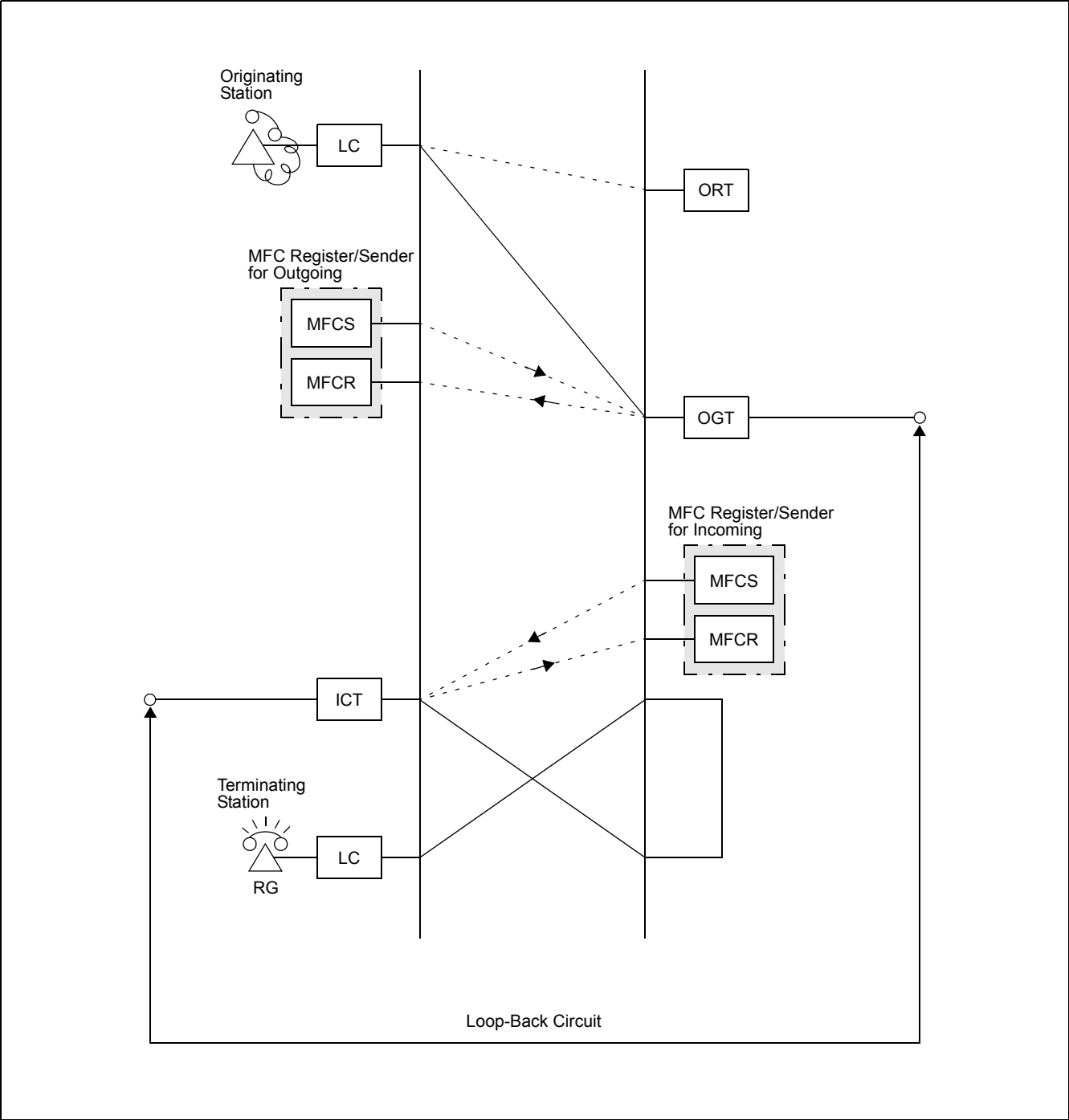


- Set up a loop-back connection between the DTI Trunk to be tested and another DTI Trunk as shown below:



- If the office is the master office, perform the tests by disconnecting the PLO and the MOSC. (The mode of the PLO becomes “Self Operation Mode”.)

Function of the MFC Register/Sender

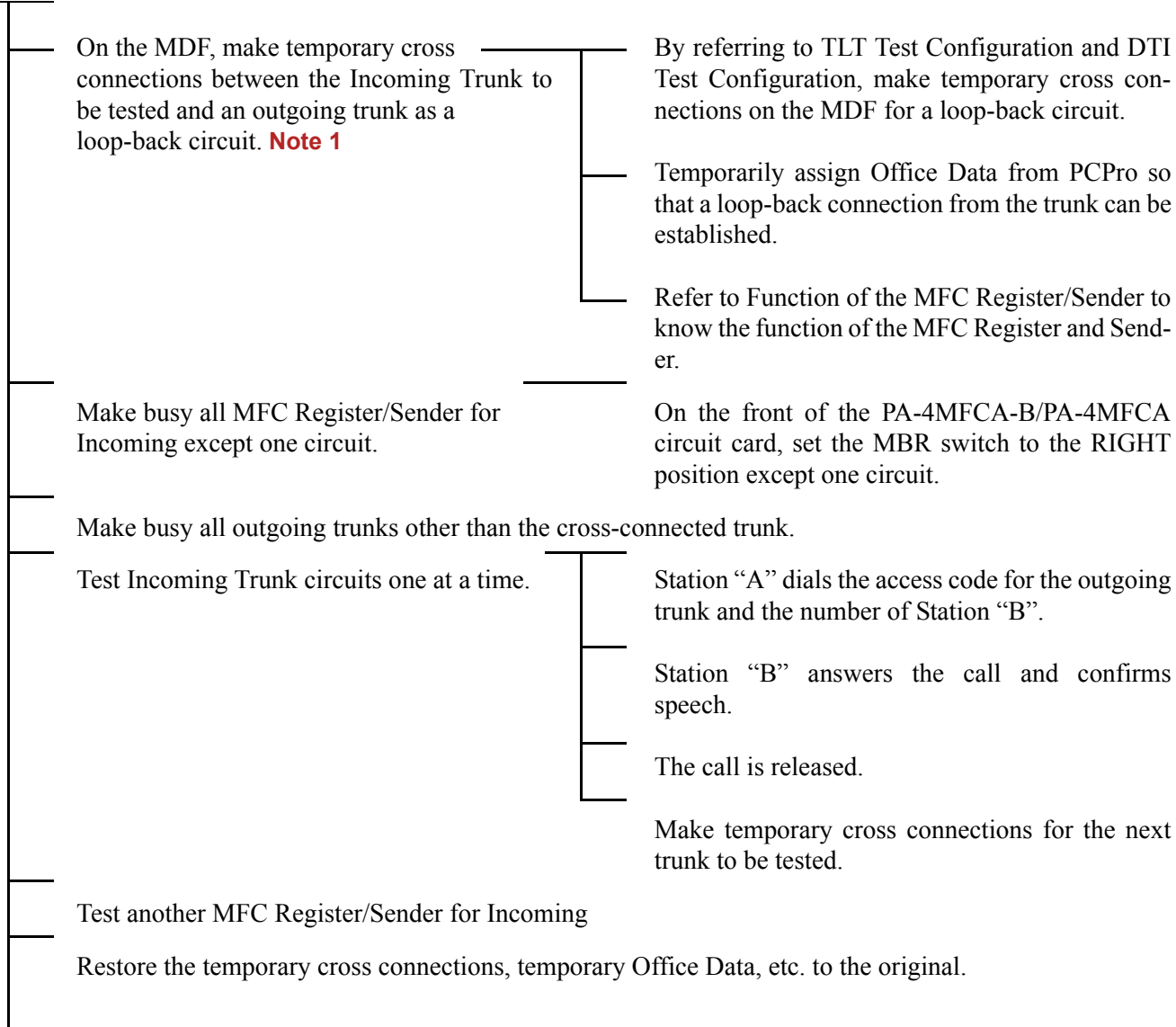


2. INCOMING TRUNK (TLT, DTI CARD) CONNECTION TEST

Test Outline:

The purpose of this test is to confirm, by setting up an incoming trunk connection test for each incoming trunk, that speech can be made with a station. This test also confirms that the call can be released. Incoming trunks must be tested one at a time using the sequence of Route and Trunk Numbers assigned at each office.

START



END

Note 1: The test by a loop-back circuit is available when both outgoing connection and incoming connection are used. When a C.O. line or Tie Line is connected with a trunk circuit, perform incoming trunk connection test one by one.