CNAS Assignment of Remote Test System Access Points

Contents

(continued)

Contents, continued

1. General

1.1 Purpose

This practice provides guidelines for entering remote circuit test system access points into the Circuit Network Administration System (CNAS), and automatically assigning these test points to special service circuits.

1.2 Filing Instructions

File this practice in numerical order in your practices set.

1.3 Copyright and Responsibility

1.4 Disclaimer

2. Overview

2.1 Definitions

The following acronyms and **terms** are used in this practice.

AcronymsITems	Definition
CNAS	Circuit Network Administration System
CTS	Circuit Test System
DDS	Digital Data Service
DPSR	Data Processing Service Request
DSX	Digital Systems Cross Connect
DTAU	Digital Test Access Unit
DTAU+	Digital Test Access Unit Plus
DX JK	Shortened form of DSX Jack for entry into CNAS
Equip	Equipment
E&M	A type of circuit signaling where circuit leads or wires are dedicated to circuit control and not shared with the voice path
GTEDS	GTE Data Services
LIU	Line Interface Unit
MC	Maintenance Connector
MCC	Maintenance Connector Controller
MDTAU	Shortened form from Mini-DTAU for entry into CNAS

(continued)

2.1 Definitions, continued

Acronyms/Terms	Definition
Misc	Miscellaneous
MTAU	Metallic Test Access Unit
MTAU-2	Standard name for a two-wire metallic **access** point in CNAS for Hekimian REACT System
MTAU-4	Standard name for a four-wire metallic access point in CNAS for Hekimian REACT System
MTAU-6	Standard name for a six-wife metallic access point in CNAS for Hekimian REACT System
MTAU-8	Standard name for a eight-wire metallic access point in CNAS for Hekimian REACT System
RAU	Relay Access Unit
REACT	Remote Access and Test
RTS	Remote Test System
SARTS	Switched Access Remote Test System
SAS	Switched Access System
SAS-2	Standard name for a two-wife metallic access point in CNAS for Tau-tron SAS
SAS-2E	Standard name for a two-wire E&M metallic access point in CNAS for Tau-tron SAS
SAS-4	Standard name for a four-wire metallic access point in CNAS for Tau-tron SAS

(continued)

2.1
Definitions, continued

Acronyms/Terms	Definition
SAS-4S	Standard name for a four-wire metallic Split/Access point for Tau-tmn SAS
SAS-6	Standard name for a six-wire metallic access point in CNAS for Tau tron SAS
SMAS	Switched Maintenance Access System
SMAS-A	Standard name for a two-wire metallic access point (A side) in CNAS for the AT&T SMAS
SMAS-B	Standard name for a two-wire metallic access point (B side) in CNAS for the AT&T SMAS
SMAS-AB	Standard name for a four-wire metallic access point in CNAS for the AT&T SMAS
SMAS-ABC	Standard name for a six-wire metallic access point in CNAS for the AT&T SMAS
T-Line	A type of detail line **in** CNAS used for equipment
T1	Digital Carrier System running at 1.54 megabytes per second (Mb/s)
UDTAU	Shortened form for Micro-DTAU for entry into CNAS
X-Line	A type of detail line in CNAS used for miscellaneous information. Carrier X-lines have less space available for information than Circuit X-lines.

3. Tau-tron Switched Access System

3.1 Description

SAS is one of the GTE Remote Circuit Test Systems (CTS) that has access points entered into CNAS and automatically assigned to Speciil Service Circuits.

SAS consists of connector groups and access points. Connector groups are numbered consecutively from 00 (in most cases), and are installed as required in the Central Office. A connector group may be accessed by only one test position at a time. Therefore, multiple test points on the same circuit in one Central Office must use a different connector group for each access to prevent blockage and to facilitate cross-off ice testing.

A connector group consists of up to 96 access points numbered 00 to 95. The 211 6-shelf configuration, however, differs because the access points are numbered 00 to 47 for the left side, and 00 to 47 for the right side. (This type of shelf has two addresses.) Certain access points may be used for a local test shoe/loop-up device, and not assigned to circuits. They may be entered into CNAS and marked as not available or omitted from the inventory.

The SAS access point consists of a set of relays that can switch three pairs designated A, B, and C. (You can find access arrangements and the associated codes for these types of circuits later in this section under "Access Arrangement and Codes'*). These access points may be used in the following manner:

- Three two-wire test access points (A, B, and C).
- One two-wire test access point with:
  - E&M using A and C pairs.

    AND

  - One two-wire test access point on the B pair.
- One four-wire test access point and a two-wire test access point (-AB and CL
- One four-wire split/access point using pairs A and B, and leaving pair C unavailable for assignment.
- One six-wire test access point, or one four-wire test access point with E&M leads using the A, B and C pairs.

3.2 Standard Names In CNAS

CNAS is populated with a unique name for access points that use two, four, or six wires. This keeps the assignment process as simple as possible, and allows CNAS to automatically assign spares with minimum manual intervention. The standard names of the access points used in CNAS are as follows:

- SAS-2 for two-wire access points.
- SAS-2E for two-wire access points with two-wire signaling.
- SAS-4 for four-wire access points.
- SAS-4S for four-wire split/te rm access points.
- SAS-6 for:
  - Four-wire E&M.
  - Two-wire with four-wire signaling/control.
  - Any circuit requiring six wires.

3.3 Allocation Guidelines

Allocation of the test access points to different test point categories is **required for CNAS to** automatically make the circuit assignments.

Circuits are of the following types:

- Two-wire.
- Two-wire E&M.
- Four-wire.
- Four-wire E&M.
- Six-wire.

For initial table allocation in CNAS, use a percentage of the estimated circuit types in the embedded special circuit base. Do this on an individual off ice basis.

In the initial allocation, slightly overassign the six-wire and four-wire test points, since it is easier to reallocate spares downward from:

- Six-wire to four-wife.

  OR

- Four-wire to two-wire.

3.3 Allocation Guidelines, continued

You may move circuits off two-wire test points to free up corresponding two-wire access points. You may then allocate the freed access points to other test points if:

- The six- and four-wire test points were not overassigned.

  AND

- *The* only extra test points are two-wire.

Spread the different types of access points vertically over the shelves so that circuits can be tested by several testers at the same time.

3.4 Assignment Considerations

When an **access** point is required, enter the information on the circuit card in CNAS, where it automatically finds a spare access point. tf a circuit requires more than one access in any location, use a different connector group for the second access. This enables cross-off ice testing when required.

Spread assignments to several circuits for a project or several circuits that are installed at the same time over several connector groups. This allows several testers to test the circuits at the same time. If this is not done, and all circuits are assigned to the same connector group, only. one circuit can be tested at a time.

Handle the percentage fill of this equipment as you do any other equipment in the CNAS data base. A quiz program can be written to determine when to order additional equipment.

3.5 Two-Wire Access Points

Enter SAS two-wire access points into CNAS according to the example below:

For Location...	The Equipment IO is...	The Bay is...	me Shelf is...	And the Posttion is...
MSKGMIXG	SAS-2	CXR-01	0-00	00A 00B ooc

NOTE: . "Bay" Is the relay rack (or bay) and the system number.

- "Shelf" is the control bus number and the connector group.
- "Position" is the access point and pair within that access.

3.5 Two-Wire Access Points, continued

The following is an example of the T-line on the CNAS layout record:

For Location...	The Equlpment ID Is...	The Bay Is...	The Shelf Is...	The Posltlon Is...	And Misc. Is...
MSKGMIXG	SAS-2	CXR–01	0–00	OOA	2WA

NOTE: . "Bay" Is the relay rack (or bay) and the system number.

- "Shelf" Is the control bus number and the connector group.
- "Posttlon" Is the access point and pair within that access.
- **"Misc" Is a free-form, 12-character field that should contain the access arrangement code to Identlfy the orlentatlon.**

3.6 Two-Wire E&M Access Points

Enter SAS two-wire E&M access points into CNAS according to the example befow:

For Location...	The Equipment ID Is...	The Bay IS".	me Shelf is...	And the Position is...
MSKGMIXG	SAS-2E	CXR-01	0-00	00

NOTE: . "Bay" Is the relay rack (or bay) and the system number.

- "Shelf" Is the control bus number and the connector group.
- "Position" Is the access point.

This configuration requires both the A and C pairs of that access.

3.6 Two-Wire E&M Access Points, continued

The following is an example of the T-line on the CNAS layout record:

For Location...	The Equipment ID Is".	The Bay Is...	The Shelf Is".	The Position Is...	And Misc. is...
MSKGMIXG	SAS-2E	CXR-01	o - 0 0	00	2EM

NOTE: . "Bay" is the relay rack (or bay) and the system number.

- "Shelf' Is the control bus number and the connector group.
- "Position" Is the access point.
- "Misc"* is a free--form,12-character field that should contain the access arrangement code to Identify the orientation.

For every two-wire E&M test access assigned, the B pair is available for use as a two-wire test point. Enter it into CNAS accorMg to the example below:

For Location...	The Equipment ID is...	The Bay is...	The Shelf is...	And the Posttion Is...
MSKGMIXG	SAS-2	CXR–01	0–01	01B

NOTE: Under "Position", a B IS used to indicate the pair within that access. All two--wlre access points must indicate a pair.

3.7 Four-Wire Access Points

Enter SAS four-wire access points into CNAS according to the example below:

For Location...	The Equipment ID is...	The Bay is...	The Shelf is...	And the Posttion is...
MSKGMIXG	SAS-4	CXR-01	O-10	01

NOTE:
- "Bay" Is the relay rack (or bay) and the system number.
- "Shelf" Is the control bus number and the connector group.
- "Posltlon" is the access point.

The four-wire circuit requires both the A pair and the B pair within that access.

3.7 Four-wire Access Points, continued

The following #s an example of the T-line on the CNAS layout record:

For Location...	me Equipment ID is...	The Bay is...	The Shelf is...	The Position is...	And Misc. is...
MSKGMIXG	SAW	cxFI-01	0–00	00	4AB

NOTE: . "Bay" is the relay rack (or bay) and the system number.

- "Shelf" Is the control bus number and the connector group.
- "Position" is the access point.
- "Misc" is a free-form, 12-character field that should contain the access arrangement code to Identify the orientation.

for every four-wire test access assigned, the C access point is available for use as a four--wire test point. Enter it into CNAS according to the example below:

For Location...	me Equipment ID is...	The Bay is...	me Shelf is...	And the Positlon is...
MSKGMIXG	SAS-2	CXR–01	0–01	01C

3.8 Four-Wire Split/Term Access Points

Do not initially allocate these types of access points; they are of limited use, and require a different relay card. (Pairs A and B within that access are used.) Place only those positions in the shelf that are properly equipped into CNAS. Enter them according to the example below:

For Location...	me Equipment ID is...	The Bay is...	me Shelf is...	And the Position is...
MSKGMIXG	SAS–4S	CXR–01	O-10	01

NOTE: . "Bay" is the relay rack (or bay) and the system number.

- "Shelf" is the control bus number and the connector group.
- "Position" Is the access point.

3.8 Four-Wire Split/Term Access Points, continued

The following is an example of the T-line on the CNAS layout record:

For Location...	The Equipment ID is...	The Bay Is...	The Shelf is...	The Position is...	And Misc. is...
MSKGMIXG	SAS–4S	CXR–01	o-00	00	CAB

NOTE:
- "Bay" Is the relay rack (or bay) and the system number.
- "Shelf" Is the control bus number and the connector group.
- "Position" is the access point.
- "Misc" Is a free–form, 12–character field that shouid contain the access arrangement code to identify the orientation.

3.9 Six-Wire Access Points

Use six-wire access points for the following types of circuits:

- Four-wire circuits on A and B pairs with E&M leads on C pair.
- Any configuration requiring six wires.

Enter SAS six-wire access points into CNAS as:

For Location...	The Equipment ID Is...	The Bay is...	The Shelf Is...	And the Position is...
MSKGMIXG	SAS–6	CXR–01	0–10	01

NOTE:
- "Bay" is the relay rack (or bay) and the system number.
- "Shelf" is the control bus number and the connector group.
- "Position" is the access point.

3.9 Six-Wire Access Points, continued

The following is an example of the T-line on the CNAS layout record:

For Location...	me Equipment ID Is...	The Bay is...	The Shelf Is...	The Position Is...	And Misc. Is...
MSKGMIXG	SAS–6	CXR–01	0–00	00	CBA

NOTE
- "Bay" Is the relay rack (or bay) and the system number.
- "Shelf" is the control bus number and the connector group.
- "Position" is the access point.
- "Misc" Is a free–form, 12–character field that should contain the access arrangement code to identify the orientation.

3.10 Access Arrangement And Codes

For Code...	The Access Arrangement is...
2WA	Two-wire circuit on pair A
2WB	Two–wire circuit on pair B
2wc	Two-wire circuit on pair C
4AB	Four-wire circuit with FE orientation
4BA	Four-wire circuit with EF orientation
2EM	Two-wire circuit on pair A with E&M leads on pair C (Type I E&M)
EM2	Two-wire circuit on pair A with E&M leads on pair C (Type II E&M)
2cc	Two–wire circuit on pair A with special control leads on pair C
MAB	Four-wire circuit on pairs A and B with FE orientation and E&M leads on pair C (Type I E&M)

(continued)

3.10 Access **Arrangement And Codes, continued**

For Code...	The Access Arrangement is...
MBA	Four-wire circuit on pairs A and B with EF orientation and E&M leads on pair C
AB2	Four-wire circuit on pairs A and B with FE orientation and E&M leads on pair C (Type ii E&M)
BA2	Four-wire circuit on pairs A and B with EF orientation and E&M leads on pair C (Type II E&M)
CAB	Four-wire circuit on pairs A and B with FE orientation and special control leads on pair C (Used for bridge leg test)
CBA	Four-wire circuit on pairs A and B with EF orientation and special control leads on pair C (Used for bridge leg test points)
OF4	Four-wire distributiin frame test trunk (Local access only)
TST	No test trunk (For WECo-designed offices only)

NOTE:
- "FE" signifies the facility is toward the A direction.
- "EF" signifies the equipment is toward the A direction.

4. Hekimian REACT Svstem Metallic Access

4.1 Description

Hekimian is another remote circuit test system that has access points entered info CNAS and automatically assigned to special service circuits.

The Hekimian REACT System for metallic access and test consists of shelves numbered from 001 to 159. Each shelf contains 50 circuit groups of access pints. Each circuit group is made up of four pairs of access points designated A, B, C, and D. (Access arrangements and associated codes are explained under "Access Command Identificatbns.") These access points may be used in the following manner:

- Four two-wire access points designated 2A, 2B, 2C, and 2D.
- Two four-wire access points designated 4A and 4C.
- One six-wire access point and a two-wire test point designated 6 and 2D. The six-wire access point is designated 6 instead of 6A because only one six wire access point is allowed, and it must use the A, B, and C pairs.
- One eight-wire access point designated 8. The eight-wire access is designated 8 instead of 8A because only one eight-wire access point is allowed, and it must use the A, 8, C and D pairs.
- Two two-wire access points and one four-wire access point designated:
  - 2A, 2B, and 4C.

    OR
  - 4A, 2C, and 2D.

4.2 Standard Names In CNAS

CNAS contains a unique name for access points that use two, four, six, or eight wires. This keeps the assignment process as simple as possible, and allows CNAS to automatically assign spares with minimum manual interventbn.

The standard names for the metallic access points in CNAS are as folbws:

- MTAU-2 for two–wire access points.
- MTAU-4 for four-wire access points.
- MTAU–6 for six-wire access points.
- MTAU–8 for eight-wire access points.

4.3 Allocation Guidelines

Circuits are of the following types:

- Two-wire.
- Two-wire E&M.
- Four-wire.
- Four-wire E&M.
- Six-wire.
- Eight-wire.

Initial table allocation in CNAS uses a percentage of the estimated circuit types in the embedded special circuit base. This is done on an individual office basis.

In the initial allocation, slightly overassign the eight-, six-, and four--wire test points, since it is easier to reallocate spares downward from:

- Eight–wire to six-wife.

  OR

- Six-wire to four-wire.

  OR

- Four–wire to two-wire.

You may move circuits off two-wire test points to free up corresponding two–wire access points. You may then allocate the freed access points to the test points of the larger–type circuits if:

- The eight-, six-, and four-wire test points were not overassigned.

  AND

- The only extra test points are two-wire.

Spread the different types of access points vertically over the shelves so that circuits can be tested by several testers at the same time.

4.4 Assignment Considerations

Spread the actual assignments of each type of Hekimian test point (eight-wire, six-wire, etc.) to the equipment over the available shelves. This albws circuits of each type (eight-wire, six-wire, etc.) to be on diierent shelves.

When you require a test point, enter the information on the circuit card in CNAS. CNAS automatically finds a spare test point. You only have to:

- Make sure that no two test points on the same circuit in the same Central Offii have the same shelf number.

  AND

- Spread **a group** of circuits on the same order over diierent shelves as much as possible.

Spread assignments of several circuits for a project, or of several circuits that are installed at the same time, over several shelves so that several testers can test the circuits at the same time. If this is not done, **and you** assign all circuits to the same shelf, only one circuit can be tested at a time.

Handle the percentage fill of this equipment as you do any other equipment in the **CNAS data base. A** quiz program can be written to determine when to order **additional** equipment and access points.

4.5 Two-Wire Access Points

The two-wire access points are designated 2A, 2B,2C, 2D. Enter them into **CNAS** according to the example below:

For Location...	The Equlpment ID is...	The Bay/ RR is...	me Shelf ts...	And the Position is...
FTWYINXA	MTAU-2	001	01	2A **2B** 2c **2D**

NOTE:
- **"Bay" Is the shelf.**
- **"Shelf" is the circuit group.**
- **"Position" Is the access pair withln that group.**

The following is an example of the T-line on the CNAS layout record for a two-wire circuit:

For Location...	The Equipment ID Is...	The Bay is...	me Shelf is...	And the Position is...
FTWYINXA	MTAU-2	001	01	2A

4.6 Two–Wire E&M Access Points

The two-wire E&M access points use the A and C pairs of the circuit group assigned. This makes the B pair unavailable for future assignment, since this pair is opened with the A and C pairs during a split access on the two-wire E&M circuit. Enter these types of circuits as MTAU–6 under the Equipment ID according to the example bebw:

For Location...	The Equlpment ID Is...	The Bay is...	The Shelf is...	And the Position is...
FTWYINXA	MTAU–6	001	01	6

The following is an example of the T-line on the CNAS layout record for a two-wire E&M circuit:

For Location...	The Equipment ID is...	The Bay Is...	The Shelf Is...	The Position is...	And Misc. Is...
FTWYINXA	MTAU-6	001	01	6	2E2

NOTE:

- "Bay" Is the shelf.
- "Shelf" **Is the circuit group.**
- **"Position"** Is the access pair (A, B, and C).
- **"Misc"** Is a free-form, 12–character field that should contain the type of circuit or the access command Identification (if applicable).

This configuration leaves the D pair for assignment as a two-wire (described in Section 4.4 above).

4.7 Two-Wire With Four-Wire Signaling

The two-wire access with four-wire signaling requires use of pairs A, C, and D. Pair B is unavailable for assignment. Enter this type of circuit into CNAS according to the example below:

For Location...	The Equipment ID Is...	The Bay Is...	The Shelf Is...	And the Position is...
FTWYINXA	MTAU-8	001	01	8

The following is an example of the T-line on the CNAS layout record for a four-wire E&M circuit:

For Location...	The Equipment ID is...	The Bay is...	The Shelf Is...	The Position is...	And Misc. Is...
FTWYINXA	MTAU-8	001	01	8	2E4

NOTE:
- "Bay" is the shelf.
- "Shelf" is the circuit group.
- "Position" is the access pair (A, C, and D).
- "Misc" is a free-form, 12-character field that should contain the type of circuit or the access command identification (if applicable).

4.8 Four-Wire Access Points

The four-wire access points are designated 4A or 4C. The B pair is automatically assigned with the A pair to 4A. Likewise, the D pair is automatically assigned with the C pair to 4C. Enter these into CNAS according to the example below:

For Location...	The Equipment ID is...	The Bay is...	The Shelf Is...	And the Position Is...
FTWYINXA	MTAU-4	001	01	4A 4c

NOTE:
- "Bay" is the shelf.
- "Shelf" is the circuit group.
- "Position" is the access pair within that group.

4.8 Four-Wire Access Points, continued

The following is an example of the T-fine on the CNAS layout record for a four-wire circuit:

For Locatlon...	me Equlpment ID is...	The Bay Is...	The Shelf is."	And the Position is."
FTWYINXA	MTAU-4	001	01	4A

NOTE:
- "Bay" Is the shelf.
- "Shelf" is the circuit group.
- "Position" is the access pair (A, B, and C).

4.9 Four-Wire E&M Access Points

Enter the four-wire E&M circuit or any other circuit requiring six wires into CNAS according to the example below:

For Location...	me Equlpment ID is...	The Bay Is...	The Shelf is...	And the Position Is...
	MTAU-6	001	01	6

NOTE: .
- "Bay" is the shelf.
- "Shelf" Is the circuit group.
- "Position" is the access pair (A, B, and C).

4.9 Four-Wire E&M Access Points, continued

The following is an examle of the T-line on the CNAS layout record for a 4-wire E&M circuit:

For Location,.	The Equipment ID Is...	The Bay Is...	The Shelf Is...	The Position is...	And Misc. is...
FTVVYINXA	MTAU-6	001	01	6	4/EM

NOTE:
- "Bay" is the shelf.
- "Shelf" IS the circuit **group.**
- **"Position" is the access pair** (A, B, and C).
- **"Misc" is a free-form, 12-character** field that **should contain the type of** circuit **or the access command Identification (If applicable).**

Thii configuration leaves the D pair for assignment as a two-wire (described in Section **4.7 above).**

4.10 Access Command Identifications

This list provides the Hekimian software commands used to install Hekimian test points. The list shows how the commands were used to create this CNAS assignment process.

For Command...	The Description is ....
2A	Two-wire access (pair A)
2B	Two-wire access (pair B)
2c	Two-wire access (pair C)
2D	Two-wire access (pair D)
4A	Four-wire access (pairs A and B)
4c	Four-wire access (pairs C and D)

(continued)

4.10 Access Command Identifications, continued

For Command".	The Description is . . .
6	Six-wire access (pairs A, B, and C)
8	Eight-wire access (pairs A, B, C, and D)
2E2	Two-wire access with two-wire signaling. (Use pairs A and C. Pair B is not available.)
2E4	Two-wire access with four-wire signaling. (Use pairs A, C, and D. Pair B is not available.)

5. AT&T Switched Maintenance Access System

5.1 Description

The SMAS System allows a tester to obtain access to many circuits from a centralized location. The SMAS uses access relays physically located in the circuit at the desired access point. On command, an access point is switched through one or more concentratkn stages to a centralized test location. The tester then proceeds with verification and testing of the accessed circuit.

The SMAS 5B System combines the network characteristics of SMAS 4A and SMAS 5A. and uses all equipment used for the network function in both systems.

The SMAS 4A network (SMAS type 5B) consists of crossbar switchframes providing connector groups for two-, four-, and six-wire access points. These units are referred to as the "connector group network" of the SMAS 5B System.

The SMAS 5A network consists of maintenance connectors providing two-, four-, or six-wire access points. These units are referred to as the *'maintenance connector network" of the SMAS 5B System.

Connector groups are numbered consecutively from 00 and are installed as required in the Central Off ice. A connector group consists of up to 100 access points numbered 00 to 99.

The following SMAS numbers are reserved for SMAS and SARTS maintenance:

- 00099 and 00199 (four-wire).

  AND

- 01099 and 01199 (six-wire).

5.1
Description, continued

Each connector group provides access to either of the following access points:

- 200 two--wire.
- 100 four-wire.
- 100 six-wire.

The two-wire and four--wire access points may be combined within a connector group; six-wire access points have separate **connector groups.**

Maintenance Connectors (MCs) are numbered consecutively from 00 and are installed as required in the central office.

A MC is a circuit pack that consists of twenty-four SMAS relays. Each SMAS relay is divided into components capable of accommodating a pair of wires as follows:

- Type 2 MCs are dedicated strictly **for six--wire applications,** and each relay consists of three components (A, B, and C).
- Type 3 and 4 MCs can be used for both two-wire and four-wire applications, and are diviied into two identical halves (A and B).

A group of ten MCs make up an MCC (maintenance connector controller) group, and a group of ten MCC groups make up a quad. Up to four quads are contained in a super quad, and up to five super quads are possible in a maximum-sized maintenance connector network driven by one RTS (remote test system).

Test access is limited to one access per MC and two simultaneous accesses per MCC group. The five-digit SMAS number identifies the specific relay, quad, MC, and super quad. For example, SMAS number VWXYZ equates to:

V	=	Super quad number (5-9).
wx	=	MC number (00-99, where w is the MCC group and x is the MC).
YZ	=	SMAS relay number (01-24 for Quad A) (25--48 for Quad B) (49-72 for Quad C) (73-96 for Quad D).

NOTE: For **an** excellent **diagram of SMAS** network architecture, see ATT **practice** 667-303-103.

5.1 Description, continued

The **SMAS** access point consists of a set of relay contacts that can switch:

- Two pairs designated:
  - A or B for two-wire access points.

    AND
  - A and B for four-wire access points.
- Three pairs designated A, B, and C for six-wire access points.

An SMAS number consists of five digits.

- The first digit selects the network segment:
  - 0 through 3 for a connector group network.
  - **5 through 9** for a maintenance connector network.
- The second and third digits select the:
  - Connector group for a connector group network.
  - Maintenance connector for a maintenance connector network.
- The fourth and fifth digits select the SMAS access point and indicate the maintenance connector quad.

5.2 Standard Names In CNAS

CNAS contains a unique name for access points that use two, four, or six wires. Thii keeps the assignment process as simple as possible, and allows CNAS to automatically assign spares with minimum manual intervention. The standard names of the SMAS access points in CNAS are as follows:

- SMAS-A for two-wire test point A side.
- SMAS-B for two-wire test point B side.
- SMAS-AB for four-wire test point.
- SMAS-ABC for six-wire test point.

5-3 Allocation Guidelines

Allocation of the test access points to different test point categories is required for CNAS to automatically make the circuit assignments.

Review the Central Offii location to determine the number of two-wire and four--wire SMAS access **points** required. Order six-wire test points for six-wire **application** only.

Review the instailed equipment to determine what is available.

NOTE: You **cannot allocate six-wire access points for use as two or four-wire access** points, nor **can you use** combinations **of four-wire or two-wire access points for accessing six-wire or eig ht-wire access points.**

Allocate the installed equipment to meet the requirements for two-wire and four-wire access points. Since it is easy to split a four-wire test point into two-wire test points, slightly overassign the four-wire test points. This allows you to easily reallocate the four-wire access points to two-wire access points if the spare two-wire access points are depleted.

Spread the different types of access points vertically over the shetves so that circuits can be tested by several testers at the same time.

5.4 Assignment Considerations

When an access point is required, enter the information on the circuit card in CNAS; CNAS automatically finds a spare access point. If **a circuit** requires more than one access in any location, use a different connector group for the second access. This allows cross-off ice testing when required.

Spread assignments of several circuits for a project, or of several circuits that are installed at the same time, over several connector groups. Thii allows several testers to test the circuits at the same time. If this is not done, and you assign ail circuits to the same connector group, only one circuit can be tested at a time.

Handle the percentage fill of this equipment as you do any other equipment in the CNAS data base. A quiz program can be written to determine when to order additional equipment.

5.5 Two-Wire Access Points

The two-wire test points are listed as SMAS-A or SMAS-B Enter them into CNAS according to the example below:

For location".	The Equipment ID Is,.	The Bay is...	The shelf IS."	And the Position Is.,.
TAMPFLXA	SMAS-A or SMAS-B	XA/559A	52/5	5913

NOTE:
- "Bay" Is the:
  - CNAS-required unique entry (XA or XB).
  - Network segment (5).
  - Connector group (59).
  - Quad (A).
- "Shelf" Is the:
  - System number (52).
  - First digit of the access point (5).
- "Position" Is the access.

5.5
Two-Wire
Access Points, continued

The following is an example of the T-line on the CNAS layout record:

For Location.,	The Equipment ID is...	The Bay is.,	The Shelf Is...	The Position is...	And Misc. is...
TAMPFLXA	SMAS-A	XA/559A	52/2	**5913**	

NOTE:
- "Bay" IS **the:**
  - **CNAS-required unique entry (XA or XB).**
  - Network **segment (5).**
  - **Connector group (59).**
  - **Quad (A).**
- "Shelf" Is the:
  - **System number (52).**
  - **First digit of the access point (5).**
- **"Position" is the access.**
- **"Misc" Is a free-form, 12-character field that can contain any orientation or miscellaneous information.**

5.6 Four-Wire Access Points

The four-wire access points are listed as SMAS-AB. Enter them into CNAS according to the example below:

For Location...	The Equipment ID Is-.	The Bay is...	The Shelf Is...	And the Position is...
TAMPFLXA	SMAS-AB	XC/51 1 A	52/5	1124

NOTE:
- "Bay" IS the:
  - CNAS-requlred unique entry (XC).
  - Network segment (5).
  - Connector group (11).
  - Quad (A).
- "Shelf" is the:
  - System number (52).
  - First dlgtt of the access point (5).
- "Position" Is the access.

5.6 Four-Wire Access Points, continued

The folbwing is an example of the T-line on the CNAS layout record:

For Location...	The Equipment ID Is...	The Bay ts."	The Shelf is.,,	The Posftion is...	And Misc. is...
TAMPFLXA	SMAS-AB	XC/511A	52/5	1124	

NOTE: . "Bay" is the:

- CNAS-required unique entry (XC).
- Network segment (5).
- Connector group (11).
- Quad (A).

- "Shelf" Is the:
  - System number (52).
  - First digit of the access point (5).
- "Position" is the access.
- Misc is a free-form 12-character field that can contain any orientation or miscellaneous information.

5.7 Six-Wire Access Points

The six-wire access points are listed as SMAS-ABC. Enter them into CNAS according to the example below:

For Location...	The Equipment ID Is...	The Bay Is...	The Shelf IS."	And the Position is...
TAMPFLXA	SMAS-ABC	XD/512A	52/5	1224

NOTE:
- "Bay" Is the:
  - CNAS-Requlred unlque entry(X0).
  - Network segment (5).
  - Connector group (12).
  - Quad (A).
- "Shelf"' is the:
  - System number (52).
  - First digit of the access point (5).
- "Position" is the access.

5.7 Six-Wire Access Points, continued

The following is an example of the T-line on the CNAS layout record

For Location	The Equipment ID Is."	The Bay is._	The Shelf Is...	The Position is...	And Misc. is...
TAMPFLXA	WAS-ABC	XDl512A	526	1224	

NOTE: .

- "Bay" Is the:
  - CNAS-required unique entry (X0).
  - Network segment (5).
  - Connector group (12).
  - Quad (A).
- "Shelf" IS the:
  - System number (52).
  - Ftrst digtt of the access point (5).
- "Posltlon'* Is the access.
- "Mlsc'~ Is a free-form, 12-character field that can contain any orientation or miscellaneous Information.

6. Hekimian REACT System Digital Access

6.1 Description

Hekimian REACT digital access can be accomplished using a:

- Digital Test Access Unit (DTAU).
- Digital Test Access Unit Plus (DTAU+).
- Mini-DTAU.
- Micro-DTAU.

The DTAU system provides split and bridged access to all connected Tl circuits. The DTAU system is normally used for most applications in large offices.

The DTAU+ system provides hitless split and bridged access to all connected Tl circuits. The DTAU+ system is normally used for Digital Data Services (DDS).

The Mini-DTAU system is a small office application product.

The Micro-DTAU system is an even smaller version for the small office application.

6.2 DTAU

A fully equipped DTAU system has 10 shelves, each of which contains 12 relay access unit (RAU) cards. Each card has the capacity for 14 four-wire circuits/T1s. Therefore, a fully equipped DTAU system provides 168 four-wire circuits/Tls per shelf, or a total Tl capacity of 1,680.

The original installation lists the shelves as l-l to l-10, where the first entry represents the initial installation. When the capacity of the original installation is exhausted, a new system is installed and the shelf numbers start over at 2-l to 2-10. Circuits are still 1 to 168 in each shetf.

The following is an example of the CNAS carrier detail X-line entry:

For Route/ Location...	The Description Is...	The Type Is...	And the Palr/Chan Is...
X NWHVINXA	DTAU	I - I	1
X NWHVINXA	DX JK	DSX-1	27
X NWHVINXA	DX JK	DSX-1	28

6.2
DTAU,
continued

NOTE 1:

- **Description Is the DTAU system description**
- "'Type" is **a two-digtt number. The firs! number represents the Installation number (1 for first, 2** far second, etc.), **and the second number represents the shelf number (1 to 10).**
- **"Pair-Chan" is the** circuit **number (1 to 168).**

NOTE 2: **An X-line must be used at this time because CNAS does not allow you to enter equipment** t **ne types as carrier system detail llnes. When this is available, the only change required Is to use the T-line type, then convert existing X-lines to T-lines.**

The DSX jack assignments for the in-and-out side of the access point are listed on the card for ease in assignment, installation, and testing. The first jack listed below the access point is assigned to the equipment or facility that is above the access point on the card. The second access point is assigned to the equipment or facility that is below the access point on the card. This form of listing is a CNAS restriction for hard-wired equipment when CNAS is revised.

For the DSX jacks:

- "Description" is DX JK as a shortened form for "DSX jack".
- 'Type" is the bay where the DSX jacks are located (i.e., -DSX-1, RR-I, 103.4, etc.).
- "Pair/Chan" is the jack number for input and output.

When entering the off ice equipment into the CNAS data base, note that shelves may have been ordered without a full compliment of associated cards for the Tls. Verify with Transmission Engineering and the Central Office

6.2 DTAU, **continued**

Use **the following table to determine how many T1 accesses are available for assignment:**

For Card #_	The Clrcuits/T1s are...
1	**1-14**
2	**15-28**
3	**29-42**
4	**43-56**
5	**57-70**
6	**71-84**
7	**85-98**
8	**99-112**
9	**113-126**
10	**127-140**
11	141-154
12	155-168

Consider circuit access blockage when assigning access points to multiple four-wire circuit/T1 orders for installation, testing, or repair. The DTAU system **has a one-in-seven blockage factor.** Each RAU is divided into odd and even four-wire circuits/Tls (1,3,5,7,9,11,13,15 **and** 2,4,6,8,10,12,14, and 16). You can access one four-wire circuit/T1 in the odd group and one in the even group at the same time, provided there are at least two test sets available. You cannot simultaneously access two four-wire circuits/T1s on the same card that are both even or odd.

6.3 Entering DTAU Equipment In CNAS

You enter the DTAU into CNAS as hard-wired equipment. The DTAU is associated with its assigned high-capacity DSX jacks.

The following is an example of the CNAS equipment table entry:

(11/11)) for the office...	(18/5) The Equipment Is...	(9/6) The Bay Is...	(5/0) The Shelf Is...	(4/4) And the Position is...
FTWYINXA	DTAU	1-1	•	1
	DX JK	DSX-1	.	314
	DX JK	DSX-1	.	214

NOTE: . "(1 I/I I)", "(18/5)", etc. Is the available characters/characters used" to allow later change with minimum work.

- "Office" is the office where the access points are located.
- "Equipment" is a shortened form of the equipment name used In the "Description" area on the X-lines of the carrier card.
- "Bay" is the entry used In the "Type" area on the X-line of the carrier card.
- "Shelf" Is an . as required by CNAS when only two items can fully describe the equipment. This is used because the X-line of the carrier card has only two items available to describe any equipment.
- "Position" is the entry used in the Pair/Chan area on the X-line of the carrier card.

6.4 DTAU+

A fully equipped DTAU+ system has 64 shelves of line interface units (LIUs) There are 14 LIUs in a shelf, and each LIU is capabte of handling one four-wire circuit/t1 . Thii provides a total of 896 four-wire circuits/t1 s.

The original installation lists the shelves as l-1 to l-64, where the first entry represents the initial installation. When the capacity of the original installation is exhausted, a new system is installed and the shelf numbers start over at 2-l to 2-64. Circuits are still 1 to 14 in each shetf.

The following is an example of the CNAS carrier detail line entry:

For route/ Location...	The Description Is."	The Type Is...	And the Pair/Chan Is...
X NWHVINXA	DTAU	1-I	1
X NWHVINXA	dx JK	DSX-1	27
X NWHVINXA	dx JK	DSX-1	28

NOTE: . "Description" Is the DTAU+ system descrlptlon.

- "Type" Is a two-digit number. The first number represents the Installation number (1 for first, 2 for second, etc.), and the second number represents the shelf number (1 to 64).
- "Palr/Chan" is the circuit number containing the LIUs (1 to 14).

NOTE 2: An X-Line must be used at this time because CNAS does not allow you to enter equipment line types as carrier system detail lines. When thls Is available, the only change required is to use the T-line type, then convert existing X-lines to T-lines.

6.4
DTAU+,
continued

The DSX jack assignments for the in-and out side of the access point are listed on the card for ease in assignment, installation, and testing. The first jack listed below the access point is assigned to the equipment or facility that is above the access point on the card. The second access point is assigned to the equipment or facility that is bebw the access point on the card. Thii form of listing is a CNAS restriction for hard-wired equipment when CNAS is revised.

For the DSX jacks:

- "Description" is DX JK as a shortened form for "DSX jack".
- 'Type" ls the bay where the DSX jacks are located (i.e., -DSX-1 , RR-1 103.4, etc.).
- "Pair/Chan" is the jack number for input and output.

When entering the office equipment into the CNAS data base, note that shelves may have been ordered without a full compliment of associated cards for the Tls, limiting assignments available. Verify with Transmission Engineering and the Central Office.

Consider circuit access blockage when assigning access points to multiple four-wire circuit/T1 orders for installation, testing, or repair. Each shelf is divided in half for access purposes. You can access only the first seven circuits/T1s or the remaining seven circuits/Tls at any given time.

6.5 Entering DTAU+ Equipment In CNAS

You enter the DTAU+ into CNAS as hard-wired equipment. The DTAlU+ is associated with its assigned high-capacity DSX jacks.

The following is an example of the CNAS equipment table entry:

(11/11) For the Office...	(18/5) The Equipment Is...	(9/6) The Bay is...	(5/0) The Shelf Is...	(4/4) And the Position Is...
FTWYINXA	DTAU+	1-I	•	1
	Dx JK	DSX-1	•	314
	DX JK	DSX-1	•	214

NOTE:
- **"(11/11)", "(18/5)", etc.** IS the "available characters/characters used" to allow later change with minimum work.
- "Office" Is the office where the access points are located.
- "Equipment" Is a shortened form of the equipment name used in the "Description" area on the X-lines of the carrier card.
- "Bay" Is the entry used in the "Type" area on the X-line of the carrier card.
- "Shelf" is an • as required by CNAS when only two items can fully describe the equipment. This is used because the X-line of the carrier card has only two items available to describe any equipment.
- "Position" Is the entry used in the "Pair/Chan" area on the X-line of the carrier card.

6.6 Mini-DTAU

A Mini-DTAU system has four relay access unit (RAU) cards housed in one shelf. Each card, as in the DTAU configuration, can handle 14 four-wire circuits/T1s.

This system is limited to a total capacity of 56 four-wire circuits/T1s. A new system, working independently of the first, must be ordered when all 56 accesses are assigned.

The following is an example of the CNAS carrier detail line entry:

For Route/ Location,.	The Description is...	The Type Is...	And the Pair/Chan is...
X NWHVINXA	MDTAU	I - I	1
X NWHVINXA	DX JK	DSX-1	27
X NWHVINXA	DX JK	DSX-1	28

NOTE 1:
- "Description" Is the Mini/DTAU system descriptbn.
- "Type" Is a two-digit number. The first number represents the Installation number (1 for first, 2 for second, etc.), and the second number represents the shelf number (always 1).
- "Pair/Chan" 1s the circuit number containing the RAUs (1 to 56).

NOTE 2: An X-line must be used at this time because CNAS does not allow you to enter equipment line types as carrier system detail llnes. When this is available, the only change required is to use the T-line type, then convert existing X-lines to T-lines.

The DSX jack assignments for the in-and-out side of the access point are listed on the card for ease in assignment, installation, and testing. The first jack listed below the access point is assigned to the equipment or facility that is above the access point on the card. The second access point is assigned to the equipment or facility that is below the access point on the card. This form of listing is a CNAS restrictbn for hard-wired equipment when CNAS is revised.

6.6 Mini-DTAU, continued

For the DSX jacks:

- "Description*' is DX JK as a shortened form for "DSX jack".
- 'Type" is the bay where the DSX jacks are located (i.e., -DSX-1, RR-I, 103.4, etc.).
- "Pair/Chan" is the jack number for input and output.

When entering the office equipment into the CNAS data base, note that a shelf may have been ordered without a full compliment of associated cards for the TIs, limiting the assignments available. Verify with Transmission Engineering and the Central Office.

6.7 Entering Mini/DTAU Equipment in CNAS

You enter the Mini-DTAU into CNAS as had-wired equipment. The Mini-DTAU is associated with its assigned high-capacity DSX jack

The following is an example of the CNAS equipment table entry:

(11/11) For the office...	(18/5) me Equipment is...	(9/6) The Bay Is...	(5/0) The Shelf is...	(4/4) And the Position is...
FTWYINXA	MDTAU	I - I	•	1
	DX JK	DSX-1	•	314
	DX JK	DSX-I	*	214

NOTE:
- "(11/11)", "(18/5)", etc. is the "available characters/characters used" to allow later change with minimum work.
- "Office" Is the office where the access points are located.
- "Equipment' Is a shortened form of the equipment name used in the Description area on the X-lines of the carrier card.
- "Bay" is the entry used In the "Type" area on the X-line of the carrier card.
- "Shelf is an * as required by CNAS when only two items can fully describe the equipment. This is used because the X-line of the carrier card has only two items available to describe any equipment.
- "Position" is the entry used In the "Pair/Chan" area on the X-line of the carrier card.

6.8 Micro-DTAU

The Micro/DTAU is self-contained in one shelf and can handle a maximum of 14 four-wire circuits/Tls. 1l is not expandable at thii **time.**

The following is an example of **the CNAS** carrier detail **line entry:**

For Route/ Location...	The Description Is...	The Type Is...	And the Palr/Chan Is...
X NWHVINXA	**UDTAU**	I - I	1
X NWHVINXA	**DX JK**	DSX-1	27
X NWHWNXA	**DX JK**	DSX-1	20

NOTE: . **"Description" is the Mlcro-DTAU system description**

- **"Type"' Is a two-digit number. The first number represents the Installation number (1 for first, 2 for second, etc.), and the second number represents** the **shelf number (always 1).**
- o **"Pair/Chan"* Is the circuit number containing the RAUs (1 to 14).**

NOTE 2: **An X-line must be used at this time because CNAS does not allow you to enter equipment llne types as carrier system detail lines. When this Is available, the only change required Is to use the T-line type, then convert existing X-fines to T-lines.**

The DSX jack assignments for the in-and-out side of the access point are listed on the card for ease in assignment, installation, and testing. The first jack listed below the access point is assigned to the equipment or facility that is above the access point on the card. The second access point is assigned to the equipment or facility that is below the access point on the card. This form of listing is a CNAS restriction for hard-wired equipment when CNAS is revised.

For the DSX jacks:

- "Description" is DX JK as a shortened form for "DSX jack".
- "Type" **is the** bay where the DSX jacks are located (i.e., -DSX-1, RR-1, 103.4, etc.).
- "Pair/Chan" is the jack number for input and output.

Since **one** card is used for all 14 four-wire circuits/T1s, no verification is needed to ensure that all cards are indeed equipped.

6.9 Entering Micro–DTAU Equipment In CNAS

You enter the Micro/DTAU into CNAS as hard-wired equipment. The Micro-DTAU is associated with its assigned high-capacity DSX jacks.

The following is an example of the CNAS equipment table entry:

(11/11) For the office...	(18/5) The Equipment Is...	(9/6) The Bay Is...	(5/0) The shelf is...	(4/4) And the Posltlon is...
FTWYINXA	UDTAU	I-1	•	1
	DX JK	DSX-1	•	314
	DX JK	DSX-1	•	214

NOTE:
- "(1 l/l 1)", "(18/5)", etc. Is the "available characters/characters used" to allow later change wlth mlnlmum work.
- "Office" Is the office where the access points are located.
- "Equlpment Is a shortened form of the equlpment name used In the "Descrlption" area on the X-lines of the canter card.
- "Bay" Is the entry used In the "Type" area on the X-line of the carrier card.
- "Shelf" Is an * as requlred by CNAS when only two Items can fully describe the equipment. This Is used because the X-line of the carrier card has only two items avallable to describe any equipment.
- "Position" Is the entry used In the "Palr/Chan" area on the X-line of the carrier card.

6.10 Reservation Of Access Points In CNAS

The onty method available at this time to keep track of the access points assignments once they have been entered into CNAS is to reserve the test points to a carrier system. The reservation is not automatically removed once an access point becomes free.

When CNAS is revised to allow the access points to be put on T-lines, the reservation feature is not required. The access points are automatically assigned and released by entering the information on the T-lines of the carrier system card in CNAS.

6.10 Reservation Of Access Points In CNAS, continued

As an access point is assigned to a carrier system, enter the following in the order number field of the reservation screen:

- The route.
- The carrier designation.
- The carrier type.

For example, when **12345-101-T1 is** entered into the 19-character Order number field of the reservation screen:

- **12345 is** the route number.
- 101 is the carrier designation.
- **T1 is** the carrier type.

To find a spare access point, ask for a spare:

. DTAU.

. DTAU+.

- MDTAU.
- UDTAU.

When a satisfactory spare is found, enter the above carrier system information in the reservation order number area.

You can release an access point by removing the carrier system information from the reservation screen for the access point assignment.

A quiz program can be written to produce a listing of all access points and the carrier systems they are assigned to.

6.11 Changes When CNAS Is Modified

The following changes are required when CNAS is modified to accept T-lines on carrier systems:

- The reservation of test points can be stopped.
- T-lines are used instead of X-lines, and the test points are automatically assigned and released.
- Existing carrier systems must be updated to change their X-lines to T-lines.
- Existing reservations must be removed, but only after the associated X-lines have been converted to T-lines.

Once this is completed, CNAS automatically assigns and releases Hekimian digital test points on all carrier systems.