

SUBJECT: Integrated Services Digital Network (ISDN) - 5ESS Switch
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PROCEDURE FOR: Distribution Svcs./Special Svcs. Personnel Involved with ISDN
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(Please remove WT 90-18-01 dated December 28, 1990. Major revisions include Multipoint ISDN information and 2B1Q Line code requirements: cover entire letter.)

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BASIC ISDN INFORMATION

Integrated Services Digital Network is sold within Ameritech under the product name "Ameritech ISDN Centrex." Distribution Services will be responsible for the Provisioning and Maintenance of Basic Rate ISDN service.

An ISDN Field Installation and Maintenance Training Course is currently offered at the TDC. Personnel involved with the provisioning and maintenance of ISDN should enroll in this course (see Advisor WT90-18-01A for class information).

Integrated Services Digital Network (ISDN) is a service that provides "digital" transmission of voice/data, simultaneously, over a single cable pair. The ISDN line between the Central Office and the customer's premises is referred to as a "pipe." The "pipe" provides three channels or transmission paths. Two of the channels are called "B" or Bearer channels, and the third is called a "D" or Signaling channel. The "B" channels are capable of transmitting 64 kbs each and the "D" channel 16 kbs (total of 144 kbs). This ISDN pipe is referred to as 2B+D and is identified as Basic Rate Access ISDN (BRA) service.

Each "B" channel is capable of:

- Circuit switched voice
- Circuit switched data
- Packet switched data

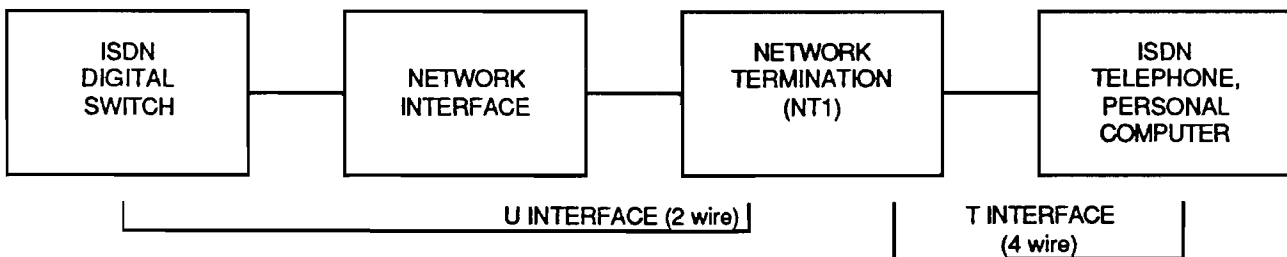
The "D" channel is capable of:

- Signaling
- Packet switched data

The D channel acts as a controller, transmitting digital messages from the CPE to the Central Office switch to carry out the various functions as requested by the customer. In addition to its signaling capabilities, the D channel also can transmit customer data in a packet format but at a lower speed than that of the B channels.

Digital telephones are used on ISDN lines or "Pipes." The digital telephone, also known as a "Voice Terminal," provides key system features and also allows a computer to be connected to the line. An analog telephone can be used on an ISDN line, but it must be connected via a terminal adapter (Digital signal is converted to Analog).

An ISDN line (pipe) is separated by different interfaces (points of reference). The interfaces or reference points are accepted International Standards and define wiring schemes, connection points, CPE and Network functions and transmission/electrical standards. The "U" interface (2 wire) extends from the ISDN switch to the Network Termination (NT1). The "T" interface (4 wire) extends from the NT1 to the ISDN CPE.



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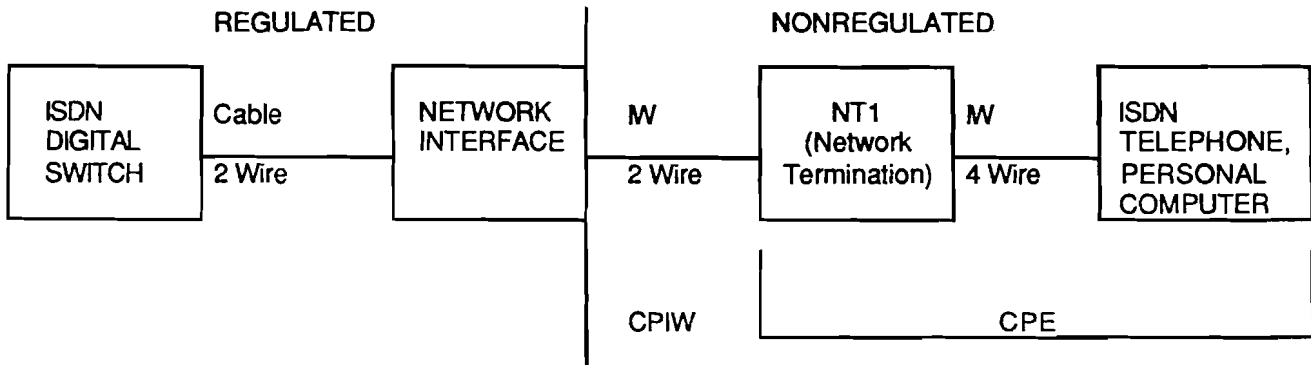
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In order to test an ISDN line, an intelligent type of test set is required to communicate in a digital format with the Central Office. The existing hand test set (butt set) used for POTS will not work on an ISDN line. The Ameritech approved ISDN test set is the Tektronic Craftek CT-100. Ordering information can be found in Advisor WT90-18-01B.

Basic Rate ISDN can be either point to point (a pipe with one work station) or it can be multi point (a pipe with several work stations).

POINT TO POINT ISDN PIPE

Illustrated below are the elements of a Basic Rate point to point ISDN line:



MULTIPOINT ISDN PIPE

Multipoint service allows a maximum of eight (8) ISDN devices to share a single ISDN Pipe. In the Wisconsin Bell tariff only two of these devices may be provisioned as "B" Channel devices. B Channel devices will support Circuit Switched Voice (CSV) applications i. e., Electronic Key Sets or Circuit Switched Data (CSD) devices. The remaining six (6) of the allowable eight devices must be "D" Channel Packet devices.

AVAILABILITY - Multipoint ISDN service is available to customers served by an AT&T 5ESS Central Office with the 5E5 or higher generic.

CPE COMPATIBILITY - Not all ISDN CPE is compatible with a Multipoint Application. Guidelines for terminal usage are listed as follows:

Base Initializing Terminals (BITS) - Base Initializing Terminals **do not** work on a multipoint ISDN pipe. In the case of AT&T CPE, these terminals are designated as Feature Package 1 (FP1). Likely examples of these types of terminals are those associated with the 650X series type terminals .

NON - Initializing Terminals (NITS) - NON - Initializing terminals work on Multipoint pipes but have a limited feature set. NOTE - AT&T does not market a NIT in Wisconsin.

Fully Initializing Terminals (FITS) - Fully Initializing Terminals work on a Multipoint pipe with full feature set. AT&T sets have the full feature sets available in Feature Package 2 (FP2).

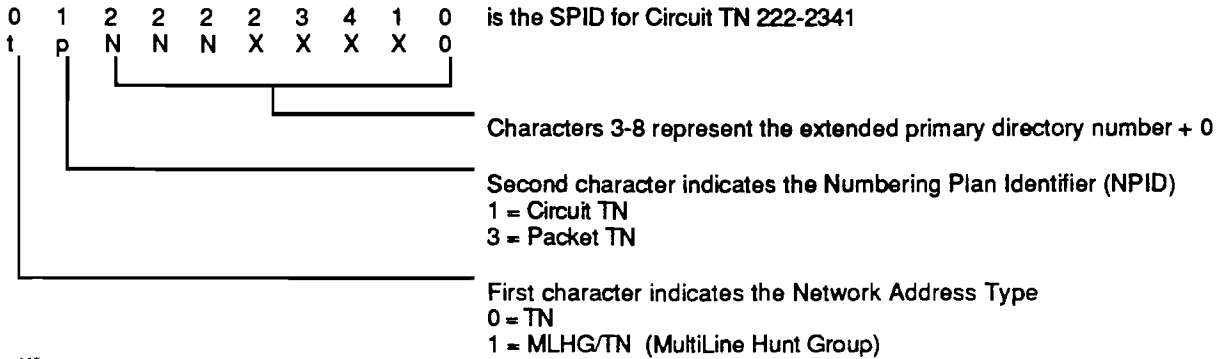
To summarize, customers requesting ISDN Multipoint BRI lines must have devices that function as a NIT or a FIT.

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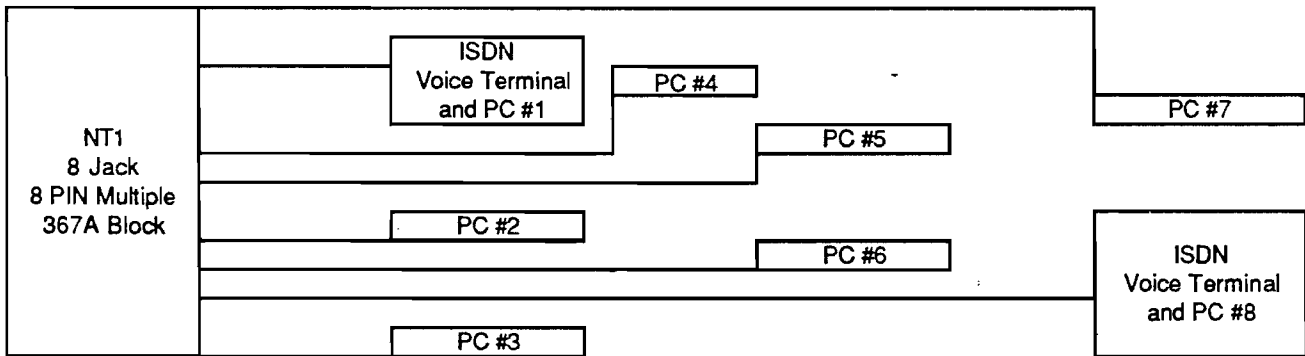
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SERVICE PROFILE IDENTIFICATION (SPID)

Since Multipoint pipes will have several ISDN terminal devices assigned to them there has to be a way for the C.O. Switch to identify each terminal. The SPID number gives each terminal device a unique identifier other than the assigned telephone number. The SPID must be programmed into each device before dial tone can be obtained. Generally this function is performed by the customer's vendor. However, if the customer requests that a WBI technician perform this task (covered in ISDN training course) all time expended will be reported to and billed as nonregulated. A SPID is made up of the following components:



Illustrated below are the elements of a Basic Rate Multipoint ISDN line (Looking at the "T" Interface) U Interface elements, C.O. to SNI, are the same as point to point:



MULTIPOINT LIMITATIONS:

- (8) terminals, maximum
- (2) CSV/CSD terminals active simultaneously
- (1-8) D-CHANNEL terminals

ISDN LOOP QUALIFICATION

Copper loops must be checked for conformance when deploying ISDN service. Marketing will request a loop qualification survey prior to selling ISDN service. The Outside Plant Engineer will determine if cable facilities can support the service. Distribution Services Field technicians may be requested by OSPE to perform transmission tests on the facilities if the plant records do not provide conclusive qualification information or the loop borders on marginal qualification. Field technician loop testing procedures are discussed later in this document.

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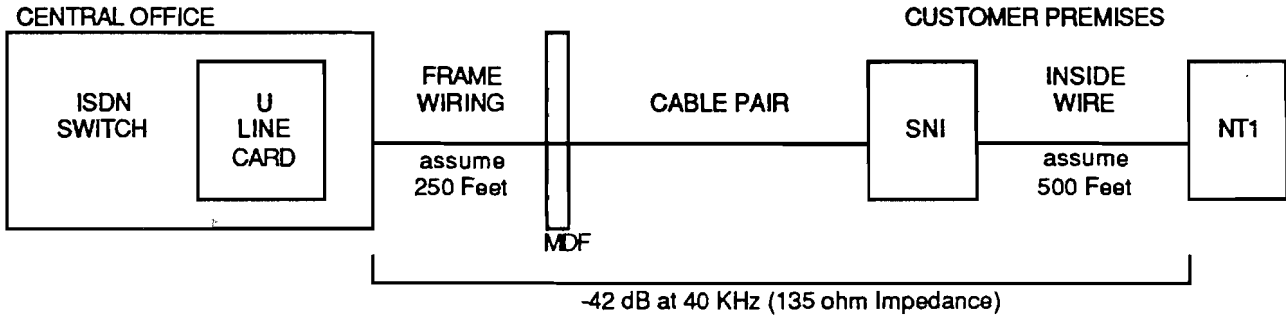
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TRANSMISSION REQUIREMENTS - Central Office to NT1 (U Interface)

NOTE - Transmission requirements are listed in two (line codes) categories, 2B1Q and AMI. Most of the ISDN pipes that have been previously installed in Wisconsin are working on the AMI line code. WBI is currently converting all ISDN Central Offices to the new 2B1Q line code. Conversion of all C.O.s to the 2B1Q line code is expected to be completed by the end of 1992.

2B1Q Requirements for all Types of Switches

The transmission requirements for an ISDN **2B1Q**, (Two Binary Bits and One Quaternary Symbol representing 4 voltage amplitudes - line code) basic rate interface line are illustrated below:



Loop requirements for ISDN are as follows:

- 1) Load coils, build-out capacitors and bridge lifters are **not** allowed.
- 2) Maximum transmission loss allowed is:

-42dB at 40 KHz with 135 ohm impedance (from C. O. U Line Card to the NT1 - assumes 250 ft of C.O. wiring and 500 ft of CPIW unless otherwise known)

- 3) Bridged tap loss must be included in overall loop loss.

Bridged tap in the feeder must be identified by length. Use a loss figure of 1.7 dB per kilofeet per bridged tap. The maximum allowable loss of a single bridged tap is 5.1 dB regardless of length.

The following chart describes transmission loss for **2B1Q** lines:

Cable Loss Constants in dB/Kft @40 KHZ - 135 OHM Termination						
CABLE GAUGE	PIC Cable			PULP Cable		
	Farenheit Temperature			Farenheit Temperature		
	68	90	120	68	90	120
	UG	BUR	AIR	UG	BUR	AIR
19	0.762	0.791	0.829	0.839	0.869	0.910
22	1.296	1.349	1.420	1.382	1.436	1.510
24	1.874	1.945	2.040	1.960	2.032	2.129
26	2.663	2.757	2.880	2.667	2.760	2.882

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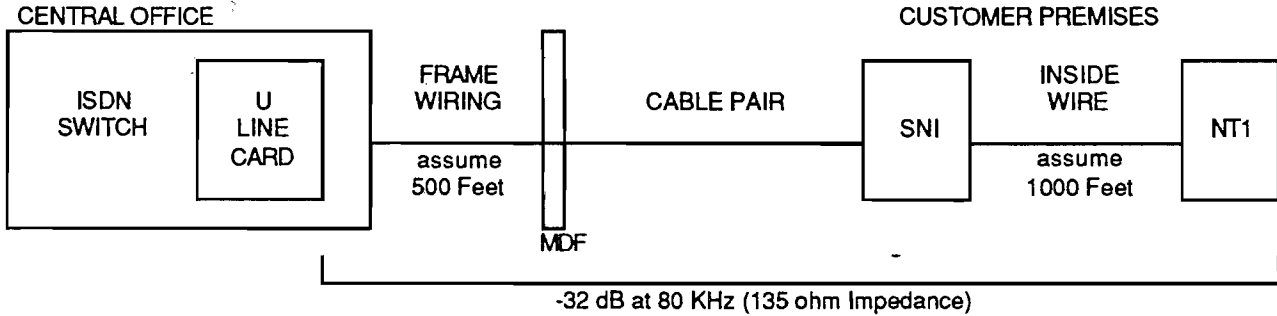
The following is an example of how the Loss Constants Chart on the previous page can be used to determine the loss for each section of the Loop:

C.O. Wire	=	0.25 Kft X 1.874 (24 ga.)	=	0.47 dB
FDR Loop	=	7.25 Kft X 2.667 (26 ga.)	=	19.35 dB
FDR BT #1	=	4.00 Kft X 1.700 (5.1 max)	=	5.10dB
FDR BT #2	=	0.50 Kft X 1.700 (5.1 max)	=	0.85 dB
Dist Loop	=	4.00 Kft X 2.040(24 ga.)	=	8.16 dB
Dist BT	=	1.50 Kft X 1.700(5.1 max)	=	2.55 dB
CPIW Wire	=	<u>0.50 Kft X 1.874 (24 ga.)</u>	=	<u>0.94 dB</u>
		18.00 Kft		36.48 dB

NOTE - To calculate Frame and CPIW Loss use the UG temperature and 24 guage.

AMI REQUIREMENTS FOR AT&T 5ESS

The transmission requirements for an ISDN AT&T 5ESS Alternate Mark Inversion (**AMI**) basic rate interface line are illustrated below:



- 1) Load coils, build-out capacitors and bridge lifters are **not** allowed.
- 2) Maximum transmission loss allowed is:

-32dB at 80 KHz with 135 ohm impedance (from C. O. U Line Card to the NT1 - assumes 500 ft of C.O. wiring and 1000 ft of CPIW unless otherwise known)

The following chart describes transmission loss for **AMI lines** according to cable gauge (at 68 degrees F):

CABLE GAUGE	LOSS AT 80 kHz (dB/Kft)	MAXIMUM LENGTH OF "OUTSIDE PLANT" LOOP (Kft)
26	3.2	8.2
24	2.2	12.0
22	1.5	17.6

- 3) Bridged tap loss must be included in overall loop loss.

In addition to cable length, bridged tap on the cable pair must also be included in the total loss calculation. Also, the location of the tap can vary the impairment to the service. Bellcore is currently attempting to develop a procedure for evaluating bridged tap effect based on location

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in the loop. The following procedure describes transmission loss computations for bridged taps:

- A. Multiply the length of a bridged tap by 0.002 dB per foot. If this result is less than or equal to 4 dB, add it to the previously computed sum. If this number is greater than 4 dB, add 4 dB (that is, add a maximum 4 dB for each bridged tap). Repeat for each bridged tap.
- B. If only the aggregate length of all bridged taps is known, then multiply the total length of all bridged taps on the loop by 0.002 dB per foot and add to the sum.

CENTRAL OFFICE WIRING QUALIFICATION

A Loss requirement (-42 dB for 2B1Q and -32 dB for AMI) is on the entire Loop. Assume that there will be 250 ft. (2B1Q) - 500 ft. (AMI) of frame wiring. When the limitation for frame wire loss must be determined use the Loss Constants table on page 5.

PREMISES WIRING QUALIFICATION (U Interface)

A Loss requirement (-42 dB for 2B1Q and -32 dB for AMI) is on the entire Loop. Assume that there will be 500 ft. (2B1Q) - 1000 ft. (AMI) of customer wiring. When the limitation for CPIW loss must be determined use the Loss Constants table on page 5.

IMPORTANT - If WBI is requested to install the IW, twisted pair (exclude quad) should be used (for both 2B1Q and AMI).

If WBI is not installing the IW, the customer's vendor should ensure that the wiring meets the loss requirements. WBI can test the wiring for transmission loss, but should bill the customer at deregulated time sensitive charges.

PROVISIONING - ISDN

(See Attachments, Provisioning Flow Chart , Samples of Service Orders, USOC decoder and sample of MAC field work ticket)

Recent Change Center

RCC will input the translations using manual Centrex forms prepared by Marketing.

OSPE

The OSPE will reserve the qualified ISDN pairs and inform Cutover to assign the loaded pair indicator of "B."

Mechanized Assignment Center

The MAC center will manually assign the "prequalified" cable facilities that were reserved by the OSPE. These pairs will be identified by the loaded pair indicator of "B."

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DSOC Load Area

The DSOC load area should identify all ISDN service orders by the USOC "WTQAD." These service orders should be sent to the Field Supervisor upon receipt so that he/she can presurvey the job.

Field Supervisor

The Field Supervisor should contact the customer and make an appointment to presurvey. During the presurvey, the supervisor should determine the start date to perform preinstallation tests and network interfacing. Arrangements should be made for transmission testing of cable facilities from the Central Office MDF to the SNI. Coordination procedures with vendor should also be arranged.

Field Technician

The Field Technician should install the appropriate Network Interface (as noted on service order) and label with each phone number.

The following "preinstallation" tests should be performed prior to the due date:

- 1) FAULTS - Loop should be clear of faults (TOK with MLT shoe test). (An UNBALANCE or a CROSS has a severe impact on this service.)

Test Equipment: KS 8455 test set or equivalent. MLT tests may also be used.

- 2) LOOP LOSS - Maximum loss from the CO Line Card to the network interface is -42dB at 40 KHZ with a 135 ohm termination impedance for a pipe served by a 2B1Q line code or -32dB at 80 KHZ with a 135 ohm termination impedance for a pipe served by an AMI line code.

NOTE: Load coils cannot be present and bridge tap should be minimal. Loop loss requirement must be met. Refer to transmission requirements sketch in this document.

Test Equipment: Hewlett Packard Model 4935 TIMS (or equivalent)

- 3) WIDEBAND NOISE - Maximum noise is 35 dBm or less with a 50 KBIT weighting and 135 ohm termination impedance (for AMI line code only).

Test Equipment: Hewlett Packard Model 4935 TIMS (or equivalent)

When the Central Office wiring and translations have been completed, the ISDN line can be tested with the Tektronics Craftek CT-100 Test Set to determine polarity, ceiling current, synchronization and line origination/termination functions.

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MAINTENANCE - ISDN

(See Attached Maintenance Flow Chart)

Repair Answer

CRSAB/MBA will answer repair calls for ISDN customers. The RSA will obtain the Primary Directory Number (PDN) of the ISDN pipe, description of trouble, callback name and telephone number. The trouble will be sent to the appropriate DSOC/Major Account Center via LMOS.

DSOC/Major Account Center

The MA/COT will determine if the trouble is related to line or feature translations or feature operation. (The RCC may be required to verify translations until such time that MAs can be trained.)

If line/feature translation or operation is correct, the ISDN pipe must be tested. The ISDN line can be tested by the MA/COT using MLT-ISDN to run diagnostic tests (as long as LMOS line record is built properly). This test can determine whether the trouble is in or out. In some cases (when MLT-ISDN doesn't work) it may be necessary to have the SCC perform a digital loop back test by accessing the ISDN switch. This test can also determine whether the trouble is in or out.

If the MLT-ISDN test determines that a dispatch is required to troubleshoot a loop fault, the trouble will be dispatched to an ISDN trained and equipped (Tektronics test set) Field Technician.

In some cases after dispatch, and the technician is unable to resolve the problem, an MA/COT may need to escalate troubles for Tier 1 support if the line passes Tektronic's testing but CPE does not function properly. The SCC contact numbers for Tier 1 support are:

Appleton	- (414) 832-1994
Madison	- (608) 252-2601
Milwaukee	- (414) 678-3606

Field Technician (Attachment shows an ISDN trouble as reflected on Craft Access Screens)

The Field Technician will isolate and fix loop fault troubles.

If the Field Technician has repaired the loop fault or not found a loop fault, and the line is still not working properly, the Tektronics test set can be utilized to determine if the customer's CPE and/or CPIW is operating properly. The Tektronics test set can simulate an NT1 and an ISDN Voice Terminal.

If the Tektronics test set indicates frame errors when testing from the SNI, (no communication with the Central Office line card), loop transmission tests should be performed with the Hewlett Packard 4935A to ensure that the facility can transmit the ISDN digital signal with no errors. Refer to the loop loss tests found in the Loop Qualification section of this letter.

Inside wire transmission/fault testing can also be performed to determine frame error trouble source. Charges apply if IW is repaired or does not meet transmission standards unless customer is on a Maintenance Plan.

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If the ISDN line passes all "Tektronic" tests, but the customer's service is not working properly, i.e., voice ok but can't transmit from personal computer, the trouble should be escalated to the SSC and DATRAN. Distribution Services is still maintenance control of the trouble and must track progress with escalation groups.

The customer should be kept informed of the trouble progress.

SERVICE COMPATIBILITY

The compatibility of ISDN and other voice/data services in the same cable sheath or binder group is governed by the degree of electromagnetic coupling of the service's signal from its pair of wires to another pair. This condition is called crosstalk, which is familiar to us with POTS service.

A major factor in reducing or eliminating crosstalk is to limit the loop length or distance to the potential customer. Another factor is the power level or signal strength. The most common crosstalk situation occurs when an Analog and Digital service exist in the same cable or binder group.

The ultimate resolution may involve moving the disturbed or disturbing service to a different binder or sheath in order to eliminate a crosstalk condition. Analyzing these troubles will not be easy. Please request assistance from Loop Support Staff.

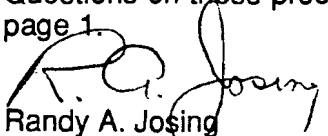
CABLE TRANSFER ACTIVITY

Cable pair rearrangements on ISDN service should be avoided, but if necessary, loop transmission testing must be done on the new facilities before the transfer work to ensure continuity of the service and customer satisfaction. Remember that ISDN lines are identified in MAC with a loaded pair indicator of "B."

CTAP Procedures for ISDN Service:

- 1) The new facilities cannot be loaded and only minimal bridge tap is allowed.
- 2) Loop Qualification tests must be done prior to the transfer work to ensure that the pairs meet the required parameters. Refer to Loop Qualification procedures and Field Technician preinstallation tests found in this document.
- 3) The transfer work must be done with no half tapping.
- 4) The transfer work **MUST** be included in the CTAP schedule, i.e., customer must be notified before cutting to the new facility (reference Advisor WT90-05-05).
- 5) The cutover test person must test the service with the customer after cutting to the new facilities. Ensure that both the voice and data service is working properly.

Questions on these procedures should be referred to the appropriate staff person as listed on page 1.


Randy A. Josing
Staff Manager - Network Provisioning

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SERVICE ORDER USOC Definitions

<u>USOC</u>	<u>Description</u>
WTQAD	Primary Directory Number (includes 3 appearances of PN on Terminal)
FGD	Secondary Directory Number
N2Q	2 Wire Basic Rate U - Interface (2B1Q = 2 Binary, 1 Quaternary)
N4Q	4 Wire Basic Rate T - Interface (2B1Q = 2 Binary, 1 Quaternary)
S2Y	2 Wire Basic Rate U - Interface (AMI = Alternate Mark Inversion)
S4Y	4 Wire Basic Rate T - Interface (AMI = Alternate Mark Inversion)
LTQ1X	Alternate Voice and Data (B Channel)
LTQ3X	Packet Switched Data (B Channel)
LTQ4X	Packet Switched Data (D Channel)
LTQ5X	Circuit Switched Voice (B Channel)
LTQ6X	Circuit Switched Data (B Channel)
ACSIX	Multiple Call Appearances (MCA) of Primary Directory Number
D08	Shared Primary or Secondary (SCA) Directory Number

Service Order Examples

The following is an example of an ISDN Service Order (point to point), installing a new ISDN line with Circuit Switched Voice (CSV) on one B Channel and Packet Switched Data (PSD) on the D Channel:

---S&E

```

RGB      1
I1      WTQAD/CX XXXX/PIC XXXC/RES XX/DES TERM ON A 7505 SET,
        CONFIG GROUP WB750701
I1      N2Q/CX XXXX
I1      LTQ5X/CX XXXX
I1      LTQ4X/CX XXXX
I1      9ZR/CX XXXX
I1      XXX/CX XXXX
I1      XXX/CX XXXX
I1      XXX/CX XXXX

```

NOTE - WTQAD designates this as ISDN service.

N2Q designates this line code as 2B1Q (U Interface).

CX XXXX identifies the Centrex number (extension).

LTQ4X identifies Packet Switched Data (D Channel).

LTQ5X identifies Circuit Switched Voice (B Channel).

Other USOCs (XXXXX/CXXXX) generally designate Optional Centrex features, Billing Plans, etc.

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Service Order Examples cont'd

The following is an example of an ISDN Service Order (point to point), Installing two new ISDN lines with Circuit Switched Voice (CSV) on one B Channel and Shared call appearance (SCA) of a primary or secondary number:

---S&E

```
RGB      1
I1      WTQAD/CX 2222/PIC XXXC/RES XX/DES TERM ON A 7505 SET,
        CONFIG GROUP WB750701
I1      N2Q/CX XXXX
I1      LTQ5X/CX 2222
I3      D08/CX XXXX
I1      9ZR/CX XXXX
I1      XXX/CX XXXX
I1      XXX/CX XXXX
I1      WTQAD/CX 3333/PIC XXXC/RES XX/DES TERM ON A 7505 SET,
        CONFIG GROUP WB750701
I1      N2Q/CX XXXX
I1      LTQ5X/CX 3333
I3      D08/CX XXXX
I1      9ZR/CX XXXX
I1      XXX/CX XXXX
I1      XXX/CX XXXX
```

NOTE - WTQAD designates both Inumbers as ISDN service.

N2Q designates these line codes as 2B1Q (U Interface).

CX XXXX identifies the Centrex number (extension).

LTQ5X identifiesCircuit Switched Voice (B Channel).

I3.....D08/CX XXXX identifies the quantity of SCAs (shared call appearances).

Other USOCs (XXXXX/CXXXX) generally designate Optional Centrex features, Billing Plans, etc.

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Service Order Examples cont'd

The following is an example of an ISDN Service Order for Multipoint Service. Installing one new ISDN pipe with **two** Primary numbers, each with Circuit Switched Voice (CSV) on a B Channel. At this time, Wisconsin will provision no more than two CSV/CSD (B Channel devices) and up to eight D Channel devices on one multipoint ISDN pipe (this will eliminate the possibility of our customer experiencing contention for service).

---S&E

RGB 1
I1 WTQAD/CX 9888/PIC XXXC/RES XX/DES TERM ON FUJITSU SRS 1050,
MULTIPOINT WITH 608 264-6931, CONFIG GROUP 03105001
I1 N2Q/CX 9888/DES ASSIGN LEN, MULTIPOINT WITH
608 264-6931
I1 LTQ5X/CX 9888/DES MULTIPOINT WITH 608 264-6931
I1 TJVDF/CX 9888
I1 E6GDF/CX 9888/CFN 266-8040
I1 9ZR/CX 9888
I1 XXX/CX 9888
I1 XXX/CX 9888
I1 WTQAD/CX 264-6931/PIC XXXC/RTE NONE/RES XX/DES TERM
ON FUJITSU SRS 1050, MULTIPOINT WITH 608 266-9888, CONFIG
GROUP 03105001
I1 N2Q/CX 264-6931/RTE NONE/DES DO NOT ASSIGN LEN,
USE LEN ASSIGNED TO 266-9888, MULTIPOINT WITH
608 266-9888
I1 LTQ5X/CX 264-6931/DES MULTIPOINT WITH 608 266-9888
I1 TJVDF/CX 264-6931
I1 9ZR/CX 264-6931/RTE NONE
I1 XXX/CX 264-6931
I1 XXX/CX 264-6931

NOTE - WTQAD designates both numbers as ISDN service, trailing info identifies multipoint service and the second number associated with this pipe.

N2Q designates this line codes as 2B1Q (U Interface), also trailing info identifies multipoint service .

CX XXXX identifies the Centrex number (extension).

LTQ5X identifies Circuit Switched Voice (B Channel), also trailing info identifies multipoint service .

Other USOCs (XXXXX/CXXXX) generally designate Optional Centrex features, Billing Plans, etc.

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The following is an example of a MAC field work ticket for point to point (top) and for multi point (bottom):

MAC Field Work Tickets

The ICKT identifies the ISDN pipe and the PN is the Primary Directory Number associated with that pipe.

Point to Point

11/19/92 10:19:25	FIELD WORK TICKET 000096	PAGE 0001
ORD N4146780793	DD 12-15-92	PTD
NPA: 414 NNX: 341		
---ASGM		
ICKT 55.IBSQ.1234..WT/ISDN		
ISDN PN 341-0002		
RT 3126 /RZ 13		
IPTY 1		
IF1 /CA 00048/PR 2149/TEA IN 625 N WATER ST;PDW		
/BP 2149		
RMTE PROTECTED,		
END		

Multipoint service (shown below) will reflect several PNs on one pipe.

Multipoint

11/19/92 10:23:25	FIELD WORK TICKET 000094	PAGE 0001
ORD N4146780790	DD 12-15-92	PTD
NPA: 414 NNX: 341		
---ASGM		
ICKT 55.IBSQ.1234..WT/ISDN		
ISDN PN 341-0003 and 341-0004		
RT 3126 /RZ 13		
IPTY 1		
IF1 /CA 00048/PR 2149/TEA IN 625 N WATER ST;PDW		
/BP 2149		
RMTE PROTECTED,		
END		

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Craft Access Screens (Maintenance)

CUST INFO section

```

|4145551212
|WISCONSIN BELL
|TECHNOLDGY DEPT.
|REVIEW to see mail

|address:                2/8
|722 N BROADWAY
|MIWAUKEE

|                          3/8
|
|ISDN    1DQ

```

TRBL INFO section

```

|initial test:           4/7
|ISDN-NT1 TERM
|
|
|Access:A0100P         5/7
|B0500P
|
|
|last trouble           6/7
|cleared: 03-01-92
|
|

```

CUST INFO section

```

|                          7/8
|route: 999 123 4567
|rec: 03-30-92 0900A
|cust at 4145551111

|FI:                    8/8
|
|ISDN
|

```

Note- Customer Info section, screen 3/8 (left side of page) reflects the ISDN & 1DQ service code & class of service, screen 8/8 reflects the LMOS message "ISDN" in the FI field.

Trouble Info section, screen 4/7 (right side of page) reflects the initial test results of "ISDN NT1 Term".

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