

SUBJECT: Ameritech Integrated Digital Network (AIDN)
 DATE: November 29, 1988
 FILE: ~~WT-88-25-17~~
 PROCEDURE FOR: All Distribution Services Personnel
 INFORMATION FOR: TDC Course Developer
 AUTHOR: Dennis Dallmann, 414-678-3653

104 RC# 8242
 AREA MGR
 MEETZ
 221 W WFA
 APPLETON

ROUTE TO:
 1. _____ Ahrens, Ron
 2. _____ Artel, Robert
 3. 12/29/88 Daul, Cyril
 4. 12-15-88 _____ David
 5. 10-15-88 Hanratty, Kirk
 6. 12-18-88 Lythjohan, Herbert
 7. 12/14/88 Noffke, Lawrence
 8. 1-3-89 Van Gheen, Gerald
 9. _____ Meetz, Dale J.

Ameritech Integrated Digital Network (AIDN) is the product name under which WBI will market ISDN (Integrated Services Digital Network). ISDN is a new Central Office based architecture that can provide voice, data, video and packet switching on a single nonloaded cable pair.

WBI is currently trialing ISDN at Alverno College located in the Metro South District of Milwaukee. During the trial, Special Services has the overall installation/maintenance responsibility. Since ISDN Services are provided over POTS type cable pairs, the decision has been made that Distribution Services will now be responsible for their overall installation/maintenance. However, until official notice, Special Services will continue to provide service at Alverno. Distribution Services will provide installation/maintenance for new AIDN customers.

unless they become major acct center type customers.

NEW AIDN CUSTOMERS

AT&T located at 111 East Wisconsin in the Metro North District (Skyline) is scheduled to cut ISDN lines during December of 1988. The lines will be served by a #5ESS Remote Switch Module (RSM) located at Broadway and hosted by the West Central Office.

McDonalds located at the Park Place complex in the Metro North District (Moraine) is tentatively requesting the installation of ISDN service in mid 1989. The lines will be served by a #5ESS RSM hosted by the Cedarburg Central Office.

ABOUT ISDN

ISDN is an architecture that provides the customer with integrated access to a host of services that had previously been available only as separate offerings. Examples of services which will be available through ISDN are POTS, CENTREX, PBX to Central Office interfaces, Facsimile, Packet Switched Data, etc. Prior to ISDN, these services required separate access arrangements. ISDN will provide the customer with end-to-end digital connectivity on one cable pair.

There are two types of ISDN access lines, Basic and Primary.

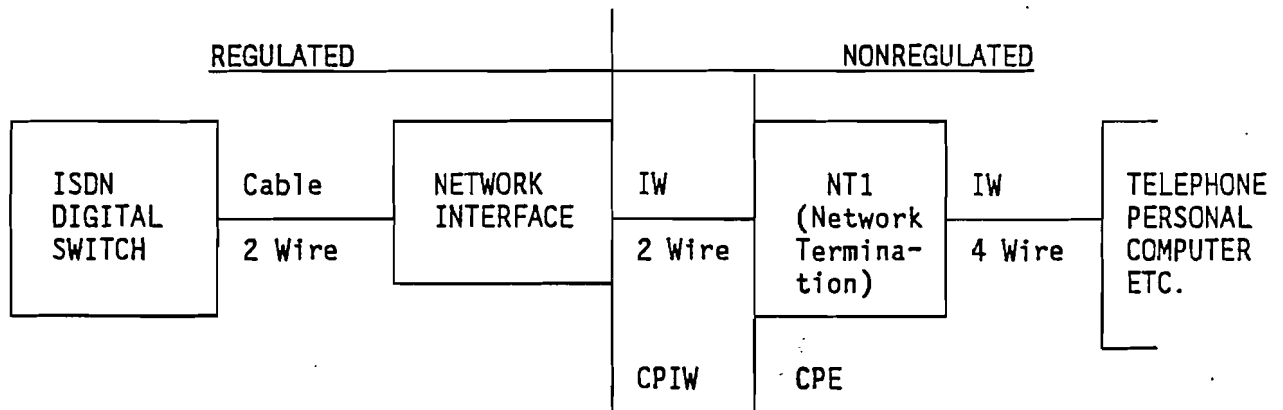
- A. Basic Rate Access (BRA) consists of two 64 kbps "B" channels and one 16 kbps "D" channel. BRA is commonly known as 2B+D and is provided over a two wire loop.

B. The early form of Primary Rate Access (PRA) will consist of twenty-three 64 kbps "B" channels and one 64 kbps "D" channel. This is also known as 23B+D and will be provided over four wires.

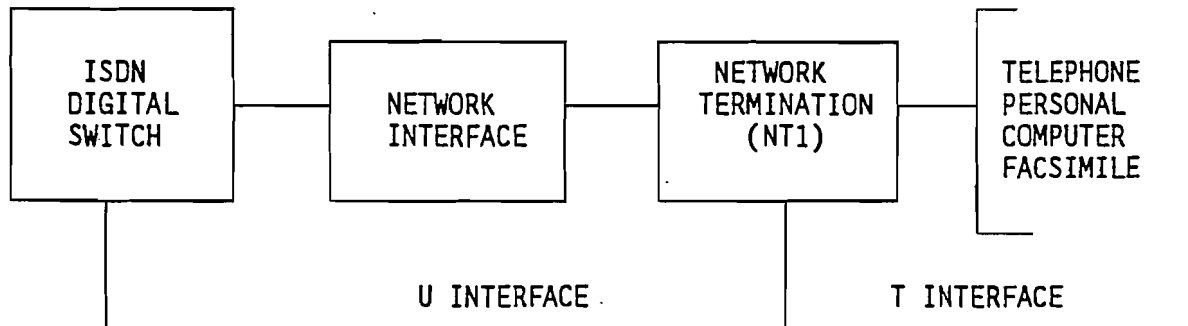
Both types of ISDN access use the "B" channel to carry voice and data communications simultaneously. The "D" channel carries signaling and control information, and package switched data.

CPE: Special customer premises equipment is required for ISDN. The operation of CPE varies by manufacturer. Existing CPE can only work over ISDN with the use of terminal adapters.

The elements of an ISDN line are broken down as follows:



An ISDN line is separated by different interfaces (points of reference). The "U" interface (2 wire) extends from the ISDN switch to the Network Termination (NT1). The "T" interface (4 wire) is between the NT1 and the customer's telephone, personal computer, etc.



TEST EQUIPMENT

The test set (handset) presently used on POTS lines cannot be used to test an ISDN line because it will not simulate the NT1 and the digital telephone set (CPE). In other words, if you plug a normal handset into an ISDN network interface you will NOT draw dial tone. Therefore, as ISDN gets introduced throughout the state, each District will have to purchase (assisted by staff) a NT1 and a Digital Telephone set (identical to customers and considered CPE) to test the customer's line at the network interface.

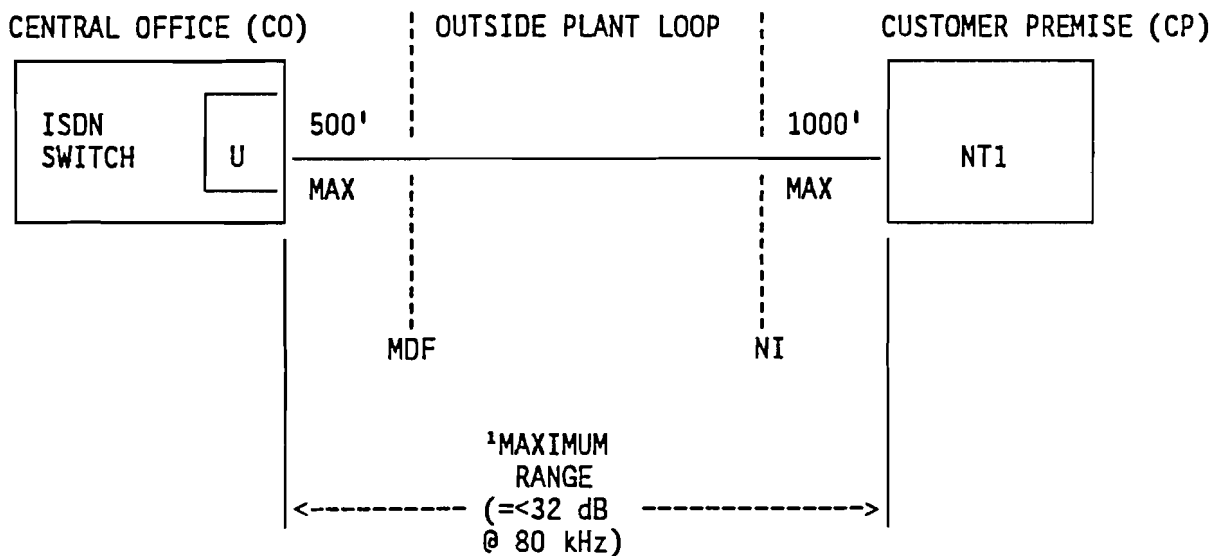
Loop transmission testing can be performed by using existing meters that are in the field today, i.e., Hewlett-Packard Meter model 4935A, and a Digital Volt-Ohm Meter.

LOOP QUALIFICATIONS - PHYSICAL LIMITS

The loop qualification process identifies loops that meet the criteria for loss, loading, bridge taps and interference with other services. A brief summary of the transmission requirements for ISDN lines are as follows:

- * Loading - Load coils, build out capacitors and bridge lifters are not allowed on any ISDN loop.
- * Loss - Loss that exists in the loop must be accounted for and not exceed the maximum allowable loss (26.5dB @ 80 kHz) from the Central Office to the Network Interface. Figure 1 displays the three elements of plant and the loop ranges associated with the Basic Rate access technology.

FIGURE 1



<u>CABLE GAUGE</u>	<u>LOSS AT 80 kHz (dB/Kft)</u>	<u>*MAXIMUM LENGTH OF OUTSIDE PLANT LOOP (Kft)</u>
26	3.2	8.5
24	2.2	12.4
22	1.5	18.1
19	1.0	27.2

* The figures shown here assume 500 ft. of central office wiring and 1000 ft. of customer premise wiring. The total loss of CO and CP wiring is not to exceed 5.5 dB.

¹ Maximum range does not include 6 dB loss margin.

MDF - Main Distribution Frame
 NI - Network Interface

PROVISIONING ISDN

DSOC Load - The DSOC load area should identify all ISDN service orders by the class of service 1DQ. 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 the job. During the presurvey, the supervisor should determine the start date to perform the preinstallation tests and network interfacing. The SCC should be contacted to have a COT available on the day and time that testing is scheduled.

SERVICE TECHNICIAN

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

A list of preinstallation tests that should be performed prior to or on the due date (as long as the due date is not in jeopardy) are listed below.

Using a Hewlett-Packert Meter model 4935A (or equivalent) perform the following tests:

Circuit Loss - The circuit loss between the MDF and the NI should be less than 26.5dB @ 80kHz.

Wideband Noise - Using a 135 ohm terminating impedance and 50 kbit weighting the noise measurements should not exceed 35 dBrrn.

NOTE - The tests listed above are in addition to the normal loop fault tests that are performed, i.e., shorts, grounds, etc.

MAINTENANCE FLOWS

Repair Answer - CRSAB/MBA will answer repair calls for ISDN customers. The RSA will obtain a callback name and telephone number for the case of trouble and the trouble will be sent to the DSOC via LMOS.

DSOC - The MA will analyze the case of trouble and verify the translations if necessary. Initially, the RCC may be required to do the verification of translations until such time that the MAs can be trained. The ISDN line cannot be tested by MLT at this time. Therefore, before dispatching a technician, the trouble should be referred to the SCC.

The SCC can access the ISDN switch to send a digital loop back message to the NT1. If the SCC fixes a trouble, they will provide a closure for the case of trouble to the DSOC. DSOC will close the trouble in LMOS.

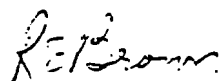
If the SCC determines that a dispatch is required to trouble shoot a loop fault, the trouble will be referred back to the DSOC for dispatch. DSOC will dispatch trouble to an ISDN trained and equipped (with NT1 and CPE) Service Technician.

The Service Technician will isolate and fix loop fault trouble. He/she will report the disposition codes to the DSOC and the DSOC will close the case of trouble in LMOS.

- * LOGICAL PROBLEMS - When the Service Technician cannot resolve the case of trouble, he/she will call the DSOC. The DSOC will call the Special Services Center (SSC) with the technician on the line. The SSC will resolve the trouble using all of the TIER 1 resources available to them, including the use of the Data/Protocol Analysis position. If the trouble is not resolved at the TIER 1 level, it will be escalated to the TIER 2 level and a person from the Datran Group will be dispatched to assist the Distribution Services Technician in resolving the trouble. (The DS technician will remain on the premises until the trouble is resolved.) The Distribution Services Technician will keep the customer informed of the trouble status. When the trouble is resolved, the DS Service Technician will provide the DSOC with disposition codes and the DSOC will close the case of trouble in LMOS.

- * This will be the procedure until Distribution Services Technicians are fully trained to resolve data troubles.

Any questions regarding this procedure should be referred to Dennis Dallmann of my staff on (414) 678-3653.



R. E. Brown
DISTRICT STAFF MANAGER -
DISTRIBUTION SERVICES

DHD:ckw