Interoffice

National Radio Astronomy Observatory

Charlottesville, Virginia

PRELIMINARY

October 7, 1981

To: J. Marymor

From: A. Shalloway

Subject: Request for Bids for NRAO Data Communications System

Attached is specification #A31800N1 covering a communications system for NRAO. Please assemble a request for bid and send the request to the companies listed on Attachment A.

In addition to the specification requirements, the following notes to the vendor or information requests should be sent with the request:

1. For purposes of estimating statistical multiplexor efficiency, it is requested that the bidders supply a detailed description (to the block, byte and bit level) of their multiplexor's synchronous output protocol.

2. If a component is supplied which is not manufactured by the bidder, even though it may have his name on it, list the manufacturer and model number.

3. We will add additional leased lines (trunks) between sites if experience or communication expansion dictates the requirement. Therefore, the bidder should explain if his equipment can accommodate or adapt to this expansion.

4. It may be that no manufacturer can meet all of the requirements. Therefore, notes on exceptions taken and additional capabilities will be helpful in determing the successful bidder.

This project will be in the range of $30,000 to $80,000. We would like to have it operating by February or March of 1982. All of the components necessary to assemble such a system are essentially "off-the-shelf."

Technical questions should be directed to Arthur M. Shalloway, telephone (804) 296-0332.

Attachments

PRELIMINARY

Codex Corporation
1776 K Street, N.W.
Suite 200
Washington, D. C. 20006
Attn: Mrs. L. Marge Dean
(202) 862-1563

Racal-Milgo Government Systems, Inc.
1111 19th Street, N.W.
Suite 600
Washington, D. C. 20036
Attn: Mr. James E. Wyatt
(202) 466-3940

Infotron Systems Corporation
301 Maple Avenue West
301 Tower Suite 513
Vienna, VA 22180
Attn: Joe Barowich
(703) 281-1760

Digital Communications Associates
303 Technology Park
Atlanta, Norcross, Georgia 30092
Attn: Mr. Hal Spurney
(404) 448-1400

Timeplex, Inc.
4103 Chain Bridge Road
Suite 110
Fairfax, VA 22030
Attn: Mr. John A. Olsen
(703) 385-3979

Micom Systems, Inc.
20151 Nordhoff Street
Chatsworth, CA 91311
Attn: Mr. Ralph Gillispie
(213) 882-6890 or
       998-8844

Halcyon
8375 Dunwoody Place
Atlanta, GA 30338
Attn: Mr. Daniel H. Wolfe
(404) 998-2210

*James L. Highsmith & Co.
8728 Forest Hill Avenue
P. O. Box 3187
Richmond, VA 23235
Attn: Mr. Eugene Hulbert
(804) 272-5888

Paradyne Corporation
700 North Fairfax Street
Suite 302
Alexandria, VA 22314
Attn: Mr. Frank H. Pruitt
(703) 548-4453

**Data Communications Systems Corporation
252 North Washington Street
Falls Church, VA 22046
Attn: Mr. Dennis Murphy
(703) 241-7803

Digital Communications Corporation
11717 Exploration Lane
Germantown, MD 20767
(301) 428-5500

Kinex Corporation
6793 Cross Bayou Drive
Largo, FL 33543
Attn: Mr. Mac Green
(813) 541-6404

*representative of Prentice Corp.

**representative of several companies

NATIONAL RADIO ASTRONOMY OBSERVATORY

Charlottesville, Virginia

PRELIMINARY

SPECIFICATION: A31800N1

TITLE: NRAO Data Communications Network

DATE: October 6, 1981

PREPARED BY: _____   APPROVED BY: _____
         Arthur M. Shalloway   R. Burns

1. Introduction

This specification covers a network of data communications between Green Bank, West Virginia, Charlottesville, Virginia, VLA site, New Mexico, and Socorro, New Mexico. Data terminal equipment (DTE) involved consists of CRT terminals (both text and graphic), IBM computers (both scientific and fiscal), printers, card readers, VAX computers, DEC 10 computers, ModComp computers, word processors (both IBM and A.B. Dick), the capability of expansion to cover Univac computers in VLB and Electronics, Apple and H-P computers in Electronics, and outside observers doing remote processing and observing.

The present planned communications requirements are illustrated in Table I and Figure 1. Included in the table are (*) additional spare communication links which are to be designed into the hardware. A second set of communication links (**) which can be handled by the system by expanding the hardware with relatively inexpensive plug-in (cards for example) units.

2. Hardware Description

The three trunks, A, B, and C, will each be a single leased 4-wire unconditioned line, type 3002. The basic equipment will consist of statistical multiplexors and 9600 baud modems with continuous automatic adaptive equalizers.

3. Required Feature

Synchronous links may be passed through the multiplexors and when synchronous data is not being transmitted, the multiplexors and modems shall have their full baud (bandwidth) capability available for all other links in the trunk. If the multiplexors cannot accept the synchronous data and it is routed from the transmitting devices directly to an input on a multi-input modem, there will be logic and control which recognizes no data transmission and transfers the full 9600 baud capability of the modem to the other modem inputs.

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4. Desirable, But Not Required Features

There will be as much remote testing as possible. Assuming Charlottesville, Virginia to be the headquarters, the ideal situation would allow an operator in Charlottesville to check every link and block of hardware in the system.

The multiplexors should have an output capability up to 19.2K baud which can be shared between two outputs feeding two modems.

The aggregate baud rate input (sum of all inputs) to the multiplexors should be 9600 X (number-of-inputs).

5. Future Add-On Capability

A. Capability to add switching either to the multiplexor or on the input to the multiplexor to allow "dial-up" type capability. That is, one terminal or computer can have a data path to various other terminals or computers.

B. Auto or manual dial-up in case of loss of transmission on the leased lines. This should include fall-back data rates to accommodate the degraded dial-up lines.
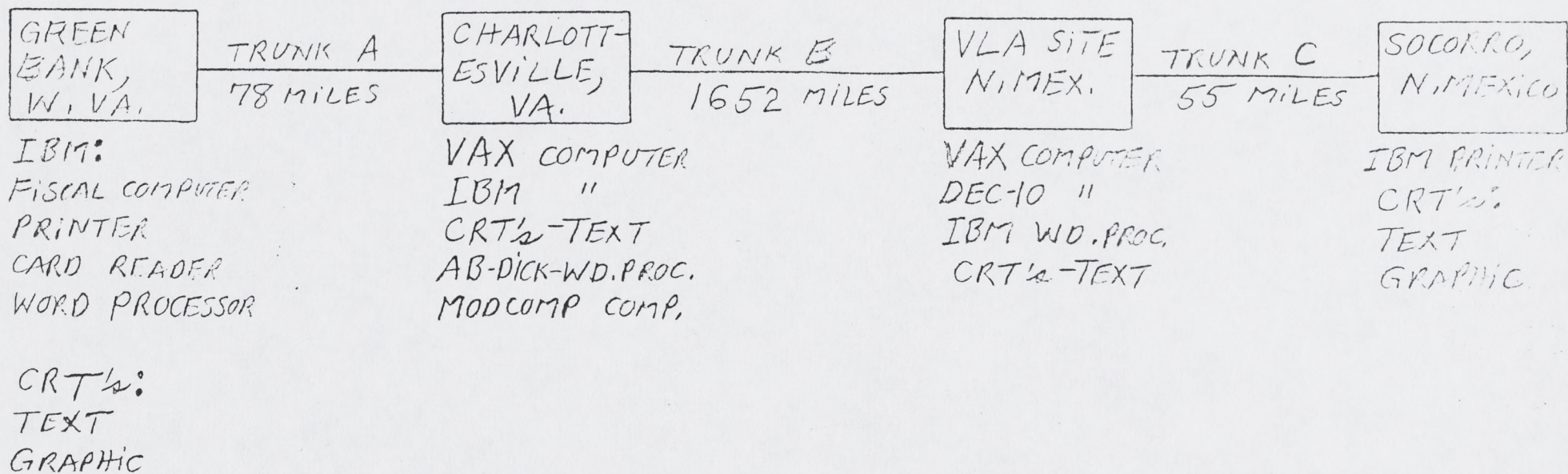
TABLE I

LINK COMMUNICATIONS NUMBER	RATE	PROTOCOL	TYPE OF DATA	NO. OF LINKS
TRUNK A				
1. GB-CRT to CV-VAX	4800 baud	Async.	Graphics	1
2. GB-CRT to CV-IBM	1200 baud	Async.	Text	2
3. CV-IBM to GB-Printer/Card Reader	4800 baud	Sync. SNA/SDLC or Bi-sync	Text	1
4. This link will be time-shared for two purposes as follows:				1
A. Soc-feedthrough to GB-fiscal IBM	2400 baud	Sync. SNA/SDLC	Text	
B. A word processor at any site to a word processor at any other site		Sync. SNA/HDLC	Text	
*5. CV to GB (unspecified DTE)	1200 baud	Async.		1
**6. CV to GB (unspecified DTE)	1200 baud	Async.		2
TRUNK B				
1. CV-VAX to VLA-VAX	4800 baud	Sync.-DDCMP		1
2. Same as 4B in Trunk A.				
3. CV-CRT to VLA-DEC 10	1200 baud	Async.	Text	1
4. CV-CRT to VLA-VAX	1200 baud	Async.	Text	1
5. VLA-CRT to CV-IBM	1200 baud	Async.	Text	1
6. VLA-CRT to CV-VAX	1200 baud	Async.	Text	1
*7. CV to GB (unspecified DTE's)	1200 baud	Async.		1
**8. CV to GB (unspecified DTE's)	1200 baud	Async.		5

TABLE I

LINK COMMUNICATIONS NUMBER	RATE	PROTOCOL	TYPE OF DATA	NO. OF LINKS
TRUNK C				
1. Soc-CRT to VLA-DEC 10	4800 baud	Asyn.	Graphics	1
2. Soc-CRT to VLA-DEC 10	1200 baud	Asyn.	Text	2
3. Soc-CRT to VLA-ModComps	1200 baud	Asyn.	Text	1
4. VLA-DEC 10 to Soc-Printer	4800 baud	Sync.-DDCMP		1
5. Same as 4B in Trunk A.				
*6. VLA to Soc (unspecified DTE's)	4800 baud	Async.		1
**7. VLA to Soc (unspecified DTE's)	1200 baud	Async.		1

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┌──────────┐            ┌──────────┐             ┌──────────┐            ┌──────────┐
│ GREEN    │  TRUNK A   │ CHARLOTT-│   TRUNK B   │ VLA SITE │  TRUNK C   │ SOCORRO, │
│ BANK,    │──────────── ESVILLE,  │──────────────│ N. MEX.  │─────────────│ N. MEXICO│
│ W, VA.   │  78 MILES  │ VA.      │  1652 MILES │          │  55 MILES  │          │
└──────────┘            └──────────┘             └──────────┘            └──────────┘
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IBM: VAX COMPUTER   VAX COMPUTER   IBM PRINTER
FISCAL COMPUTER   IBM   "   DEC-10 "   CRT's:
PRINTER   CRT's-TEXT   IBM WD.PROC.   TEXT
CARD READER   AB-DICK-WD.PROC.   CRT's-TEXT   GRAPHIC
WORD PROCESSOR   MODCOMP COMP,

CRT's:
TEXT
GRAPHIC

NOTES: TRUNKS CONSIST OF 1 EACH LEASED UNCONDITIONED 4-WIRE TYPE 3002 LINE.
       MILEAGES GIVEN ARE TARIFF MILEAGES.

NRAO DATA COMMUNICATIONS NETWORK   A.M. SHALLOWAY
          FIGURE 1   10-6-81