

ASSEMBLY AND ARRANGEMENT OF AN
AREA COVERAGE DESIGN

CONTENTS

- | | |
|--------------------------------|--------------------------------|
| 1. GENERAL | 7. FUTURE UPGRADING COST |
| 2. NARRATIVE | 8. TRUNKING DIAGRAM |
| 3. SUBSCRIBER DATA | 9. MAPS OF THE PROPOSED SYSTEM |
| 4. CONNECTING COMPANY DATA | 10. CIRCUIT DIAGRAM |
| 5. CONSTRUCTION COST ESTIMATES | 11. APPENDIX |
| 6. URBAN-RURAL BREAKDOWN | 12. ENGINEER'S WORK SHEETS |

1. GENERAL

1.1 This section provides REA borrowers, consulting engineers, contractors, and other interested parties with information for use in the preparation and completion of an area coverage design. TE & CM 203, "Existing Plant Considerations for a Telephone System Design," discusses some of the preliminary and existing plant considerations that are involved. REA TE & CM 204, "Telephone System Design," covers important engineering and design criteria for the area coverage design. TE & CM Sections 203, Issue 1; 204, Issue 1; and 205, Issue 5 replace Section 205, Issue No. 4, March 1963, "Preparation of an Area Coverage Design," its addenda, and the "Guidelines for System Development."

1.2 A complete Area Coverage Design (ACD), as described in this section, is now only required for the first loan to a new loan applicant. Subsequent loans will follow the supplemental loan procedure described in REA Bulletin 320-14: Loans for Telephone System Improvements and Extensions.

1.3 Supplemental loans for areas not previously served by existing REA borrowers will require the data shown in Exhibits E, F, and G and the maps to be included with the other data called for in REA Bulletin 320-14.

1.4 The ACD should be assembled and presented in a manner that the results of the various studies appear in a form most useful to the owner and to REA in reviewing it and in analyzing the capital requirements. At a later date the design will be the basis for planning the

construction of the system. A table of contents should be prepared showing the page numbers of the various exhibits and listing the maps.

1.5 The paragraphs that follow establish the plan for the presentation of the ACD. A sample ACD made in accordance with this plan is attached to this section for guidance purposes. Considerable information developed or acquired by the engineer need not be submitted as part of the ACD, but should be retained because additional justification for certain aspects of the design may be requested. Some examples of this type of data are included as an attachment labeled "Engineer's Work Sheets."

2. NARRATIVE

2.01 The narrative should consist of a general discussion indicating the purpose and amount of the proposed construction. It should also include a discussion of immediate and long-range plans for upgrading; provisions for EAS; new types of subscriber services (such as pushbutton dial, data, facsimile, call waiting, abbreviated dialing, etc.); and other plans relating to the development of telephone service in the area.

2.02 The narrative should discuss generally the existing system and the proposed construction plans in sufficient detail to provide a clear and logical picture of the proposed telephone system. It should give the considerations for utilizing existing central office equipment and outside plant in the proposed system, plans for reinforcing and expanding existing equipment and plant, and the justifications for and extent of proposed removals and retirements of existing equipment and plant. The environmental aspects of the proposed construction should be discussed in accordance with requirements in REA Bulletin 320-21.

2.021 The existing central office equipment should also be described in the narrative or in the central office equipment exhibit as to equipped lines, manufacturer, date of manufacture, TPS or TPL operation, and central office resistance limit.

2.03 The narrative should evaluate the alternate plans of service considered during the design stage and indicate the reasons for selection of the recommended plans which have been developed in detail.

2.04 The narrative should explain any unusual construction or operating problems anticipated for the proposed system and specifically point out any conditions such as excessive rock digging, heavy right-of-way clearing, and any other situations that have significantly influenced the cost estimates prepared for the system.

2.05 Any new toll or EAS trunks proposed should be fully described. Where the proposal involves new routes, borrower ownership of facilities not previously owned, or major revisions in the type of facilities, the costs should be stated separately and a summary of discussions with the connecting companies and written concurrence with the proposals should be included.

2.06 When point-to-point radio (microwave) will be employed, refer to the 900 series of sections in the Telephone Engineering and Construction Manual for guidance on the information to include in the ACD.

2.07 If the application requests funds for mobile radio or paging systems, the information specified in REA Bulletin 385-1, Preloan Procedures and Requirements for Two-Way Radio Telephone Service, should be included.

2.08 If the application requests funds for commercial office, garage, or warehouse facilities; an explanation for the need should be given. There should also be a statement as to the location and whether the land is owned or will be purchased. An exhibit is required including a plot plan and a floor plan showing dimensions and intended use of the space.

2.09 If the application requests funds for facilities to serve large military or other governmental installations, industrial complexes, or similar subscribers involving investments in excess of \$100,000 for any single subscriber; an exhibit presenting a description of the service requirements, the facilities to be furnished, and the probable contract terms should be submitted.

2.10 The following certification is required to be signed by a principal of the engineering firm and the borrower, and by the REA Loans and Operations Field Representative and the REA Field Engineer.

2.101 Certification: We the undersigned certify that the data in this Area Coverage Design are correct to the best of our knowledge and belief and reasonably reflect the cost to serve the subscribers as proposed on the Forms 569, Area Coverage Survey, which are integral parts hereof.

2.11 Exhibit A is an example of the format and content of the narrative of an ACD.

3. SUBSCRIBER DATA

3.1 The area coverage survey is a companion document, and none of the discussion in it need be duplicated.

3.2 Subscriber data should be shown on REA Form 569 on a system basis and by central office areas. Exhibit B is an example of the required data.

4. CONNECTING COMPANY DATA

4.1 A completed REA Form 809 and copies of minutes of meetings with the connecting company or companies are required as part of the ACD. This material or a letter from the connecting company should show that the connecting company concurs with the information presented in REA Form 809.

REA TE & CM 205

4.2 If the toll traffic agreements differ from the Bell Standard Traffic Agreement as outlined in REA TE & CM Section 225, then copies of letters or agreements with the connecting companies which indicate the annual expenses and revenues and other connecting company arrangements should be included unless they have already received prior REA approval.

4.3 If the EAS traffic agreements differ from the 50 percent ownership or lease agreement, then copies of letters or agreements with the connecting companies which indicate the connecting company arrangements should be included unless they have already received prior REA approval.

4.4 Exhibit "D" is an example of the connecting company data.

5. CONSTRUCTION COST ESTIMATES

5.01 Cost estimates must be submitted in summary for the proposed system, and also in detail by exchange areas, covering the plant facilities which it is anticipated will be required to serve the design requirements. The cost estimate should include the cost of making retained or rebuilt plant suitable for operation in the proposed system.

5.02 The cost estimate of outside plant should be prepared on the basis of estimated pole line, buried or underground route miles for the various configurations, and sizes and types of facilities. See Exhibit G.

5.03 Other items of significant cost are to be shown in a convenient tabular form. See Exhibits D, E, and F.

5.04 Cost Estimate Summary

5.041 Show a summary of the cost of construction by (1) major plant items, (2) for each exchange, and (3) also for the total system. When practical this should all appear on one page. See Exhibit D.

5.042 Land and Buildings--The cost for new buildings and/or additions to buildings should be estimated on a cost per square foot basis. The type of building (such as headquarters, CDO, warehouse, garage, microwave, etc.) should be indicated. The cost estimate should include associated costs such as paving, landscaping, fencing, etc. The cost for any new land required should be provided. Removal costs of retired plant, if any, should be given.

5.043 Central Office Equipment--The cost for central office equipment developed in Exhibit E should be shown. Removal costs of retired plant, if any, should be given.

5.044 Station Equipment--The cost for station equipment developed in Exhibit F should be shown. Removal costs of retired plant, if any, should be given.

5.045 Outside Plant--The cost for outside plant developed in Exhibit G should be given with the following breakdown:

- a. Exchange Construction Cost
- b. Removal Cost Nonreusable Material (Included with other plant)
- c. Removal Cost Reusable Material (Included with other plant)
- d. Right-of-Way Procurement

5.046 Special Projects-- If the application includes facilities to serve large military or other governmental installations, industrial complexes, or similar subscribers involving investments in excess of \$100,000 for any single subscriber, list it separately.

5.047 Mobile Radio Service--The total system costs are to be shown on a separate line instead of in the individual exchanges because it is considered a system service. Removal cost of retired plant, if any, should be given.

5.048 Microwave--The total system costs are to be shown on a separate line instead of in the individual exchanges because it is considered a system service. Removal cost of retired plant, if any, should be given.

5.049 Vehicles and Work Equipment--The total system costs are to be shown on a separate line instead of the individual exchanges. Include the cost of all equipment to be purchased of the type carried in FCC Account 264 (or 1064) as well as test equipment which is normally carried in other accounts (such as COE) but is used on a system wide basis rather than in a particular exchange. Removal cost of retired plant, if any, should be given.

5.050 Office Equipment--The total system costs are to be shown on a separate line instead of the individual exchanges. Include the cost of all equipment to be purchased of the type carried in FCC Account 261 (or 1061). Removal cost, if any, should be given.

5.051 Preloan Engineering--Include all engineering costs anticipated in preparing the complete loan application. A review of REA Form 835, "Preloan Engineering Service Contract," is recommended as a basis for estimating the costs which may result in connection with preloan engineering. Include an allowance for miscellaneous post ACD work that will be performed by the engineer such as preparation for special meetings, commission hearings, or other negotiations which may occur prior to the Postloan Engineering Service Contract phase.

5.052 Route Miles of Plant--The route mileage shown in this part is needed to arrive at the net total route miles to be in the central office area as a result of the proposed loan. This net total is the existing, plus "new," less the mileage to be retired. Drops or buried

services are to be included. The mileage to be modified does not affect the total since it is the amount of the existing plant to be changed, modified, or replaced. The net total route mileage is needed to calculate the system subscriber density. For this purpose a route may include one or more types of facilities, such as aerial and buried plant, and may include facilities for distribution, toll service, and EAS. The facilities along both sides of a road are generally considered to be along the same route. An exception to this would be the case of limited access highways or other streets where separate facilities are installed to serve on each side because crossings are prohibited or undesirable. Microwave or radio links are considered separate routes. Service drops off the main route are considered as additional route mileage.

The route miles of facilities should be determined and inserted in the proper category. "Existing" route miles are the route miles of facilities in place at the time the report is prepared. If the Area Coverage Design does not include all central office areas in the system, then the "Existing" route miles of those exchanges not included should be stated in the narrative. "New" route miles includes only facilities to be built along "new" routes. Route miles to be "Retired" occur when all the facilities along the route are removed and the route is not reused. Plant is considered to be "Modified" when existing plant is reinforced or replaced with new facilities along the same route.

5.053 Retired Plant--Enter the original cost of all types of telephone plant to be retired and estimated salvage value. This includes all outside plant to be retired whether or not the route is abandoned.

5.054 EAS to be Established With This Loan--Enter the cost of any new EAS proposed for each exchange and give the system total.

5.05 The cost estimate for central office equipment should indicate quantities and costs (by exchange) for additional lines, terminals, and trunks or for these items in a new central office if applicable. Special equipment items such as automatic number identification (ANI), automatic toll ticketing (ATT), carrier (toll, EAS, or station), voice frequency repeaters, long line equipment, standby generators, battery replacement, etc., should be shown. See Exhibit E.

5.06 The cost estimate for station equipment should indicate quantities and costs (by exchange) for (a) main station installations including telephone set, service, inside wiring, and protector; (b) extensions to main station, PABX's and PBX's, including the telephone set and inside wiring; (c) PABX and PBX's (list each size separately); (d) key systems including switching unit (if any), key telephones, wiring, service and protector; and (e) paystations and miscellaneous subscriber equipment cost such as extra cost for pushbutton dial sets (if all telephone sets are not pushbutton), data phones, facsimile, etc. See Exhibit F.

6. URBAN-RURAL BREAKDOWN

6.1 If the application includes improvements or construction in an exchange serving a town of over 1,500 population, the narrative shall include the name of the town and the number of existing and new subscribers by grades of service located within the urban limits.

The following information shall also be submitted:

- a. The cost of central office equipment, less toll and EAS trunks to be purchased for this exchange
- b. The cost of outside plant facilities to be constructed within the corporate limits to serve subscribers within the corporate limits. The cost of outside plant facilities for trunks should be excluded.
- c. The cost of outside plant facilities to be constructed within the corporate limits to serve subscribers outside the corporate limits. The cost of outside plant facilities for trunks should be excluded.
- d. The cost of station equipment to be installed within the corporate limits
- e. The cost of commercial office land and building facilities to be constructed within the corporate limits
- f. The cost of central office land and building facilities to be located within the corporate limits
- g. The cost of toll trunks (including selectors, carrier, carrier repeaters, V.F. repeaters, and outside plant) to be added within the corporate limits and the cost of the same trunk facilities located outside the corporate limits to the point of connection with the connecting company
- h. The cost of EAS trunks (including selectors, carrier, carrier repeaters, V.F. repeaters, and outside plant) to be added within the corporate limits and the cost of the same trunk facilities located outside the corporate limits but within the central office area
- i. The cost of EAS trunks including selectors, carrier, carrier repeaters, V.F. repeaters, and outside plant from the exchange boundary to other central offices which are part of the applicant's system

6.2 In the event the method of allocating costs as outlined above does not seem appropriate for the proposed loan under consideration, the method of allocating should be referred to the REA area engineering office for decision.

6.3 Exhibit "H" is an example of an Urban-Rural Breakdown.

7. FUTURE UPGRADING COST

7.1 When a loan application proposes to upgrade some exchanges in a system to all one-party service, then a cost estimate should be made that would allow the remaining exchanges to be upgraded to all one-party at a later date. Also when a loan application proposes to upgrade

REA TE & CM 205

some exchanges from eight- to four-party service, then a cost estimate should be made that would allow the remaining exchanges to be upgraded to four-party at a later date. Exhibit "I" is an example of such an estimate.

8. TRUNKING DIAGRAM

8.1 A trunking diagram should be submitted which shows the following:

- a. Central offices which are involved in the loan application. The offices should be in their approximate geographical positions.
- b. The number of existing trunks as well as the number of proposed trunks estimated for each group at the end of 5 years. Tandem operations should be indicated if any are anticipated.
- c. The length, makeup, and division of ownership of each trunk group
- d. Loading, carrier, radio, and voice frequency repeaters where such are involved, and data on the type of service the trunk group renders
- e. Transmission data (1000 Hz loss) for each new and each existing trunk group
- f. Traffic data for each trunk group showing the grade of service planned
- g. The proposed additions and removals

8.2 The sample ACD provides the trunking diagram as Exhibit J.

However, in cases where the trunking diagram is more complex, it should be submitted as a separate enclosure, as are the maps.

9. MAPS OF THE PROPOSED SYSTEM

9.1 Maps are to be submitted with the Area Coverage Design for all central office areas for "A" borrowers and for areas not previously served by existing borrowers. For areas previously served by existing REA borrowers, a similar map is required to be submitted to REA for approval prior to staking and preparing the outside plant plans and specifications. A detail map of each such central office area showing the proposed 5-year plant, a town map, and map of each congested area which cannot be shown adequately in sufficient detail on the central office area map showing the proposed 5-year plant should be included. Submission of a key map may also be necessary where the system consists of numerous central office exchanges.

9.11 Detail maps should be to a scale, depending on the size of the exchange and the congestion anticipated. The entire central office area to be served should be shown on a single rectangular sheet not in excess of 42 inches wide by 48 inches long, if practicable.

9.2 Reproducible transparencies of detail maps may be used as a base for adding plant details.

- 9.21 The central office area detail map should show the following:
- a. State, county, township, and municipal boundaries
 - b. Proposed central office area boundary; system boundary where appropriate
 - c. Federal and state highways and county roads
 - d. All rivers
 - e. Railroads
 - f. National and state forests and parks
 - g. Major physical features which will affect the routing of lines such as lakes, mountains, swamps, etc.
 - h. Names of other telephone companies serving the area contiguous to the system boundaries
 - i. All existing, held order and potential subscribers with a distinctive number assigned to each
 - j. Electric transmission lines, including voltage, number of phases, method of operation (i.e., wye or delta), and ownership
 - k. Range, township, and section lines where they exist
 - l. Proposed grades of service for all existing subscribers. (The most used grade of service is generally shown by omission. For example, on the Westover map, residence one-party service is not shown.)
 - m. Proposed grades of service for held orders and for those potential subscribers for which facilities are to be provided
 - n. Proposed central office location
 - o. Proposed zones if not all one-party
 - p. Location and routing of proposed lines
 - q. Location, number of pairs, and gauge of existing and proposed facilities such as distribution wire, buried wire, cable, etc.
 - r. Number of wires by material and size for any existing and proposed open wire lines
 - s. Joint pole line or buried construction proposed with other utilities
 - t. When there are wide-spread retirements (as in the case of a magneto system with 80 percent outside plant retirement) to avoid unnecessary drafting costs, the retired line plant data need not appear on the map; but the types of retirements should be covered by a note on the map. For example, "All bracket type construction will be retired."
 - u. A zone line beyond which the outside plant loop resistance requires voice frequency repeaters.
 - v. Indicate the cumulative resistance in ohms for the longest subscriber loop in each lead over 1700 ohms, and show the cable gauges in the longest circuits.
 - w. The location and quantity of field mounted voice frequency and carrier frequency repeaters
 - x. Show the outside plant loop resistance at the symbol for all pay-stations required to operate on outside plant loops exceeding 750 ohms.
 - y. Indicate by note, at the central office area boundary, leads having trunk circuits. Show the trunk usage, terminating points, and number required for the 5-year period.
 - z. At changes in facilities of 25 pair cables or larger, at the rural-urban boundary (if any), and at the central office, show the number of subscribers served by physicals and separately the number served by carrier.

REA TE & CM 205

9.3 Town maps or maps of congested areas too complicated to be shown as a blow-up on the exchange map shall include on them the appropriate information listed in paragraph 9.2 plus street names, alleys, and property lines where readily available.

9.31 Town maps or maps of congested areas should be to a scale depending on the size of the town and the congestion anticipated. The size of the town map should not exceed the size of the central office area detail map with which it is associated, if practicable. All inserts on central office area detail maps should be to the same scale on one system, if practicable.

9.4 The purpose of a key map is to illustrate the extent of service area and the orientation of the various central office areas with respect to each other. The following information has been found useful, but other information desired by the owner may be included.

- a. Central office area boundaries and system boundaries
- b. Routes of EAS and toll trunk lines interconnecting the central offices with each other and to the toll center and other connecting company offices
- c. State, county, and municipal boundaries
- d. Names of telephone companies serving the area contiguous to the system boundaries
- e. Range township and section lines where available
- f. Major geographical and cultural features
- g. Federal and state highways and county roads

9.41 Key maps, when furnished, should be prepared to a scale which will result in a sheet size not in excess of 42 inches wide nor more than 48 inches long. A key map is to be submitted to REA only when recommended by the REA field engineer.

9.5 Mapping standards shall conform to the preceding requirements. Except for unusual cases, the symbols shown on the maps should be in accordance with REA Form 510. (This form is included with the ACD attached.)

9.6 Borrowers following the supplemental loan procedure described in REA Bulletin 320-14 are required to submit maps similar to those described above prior to staking. The following additional information should be provided on prestaking maps:

- a. Load coil location, type of loading, and number of load coils at each location
- b. Station carrier assignments by system and channel number for subscribers to be served by carrier
- c. Establishments assigned to the same party line are to be grouped by encircling them with a light line.

9.7 Maps should not be submitted to REA in rolls. They should be folded with the title block in view.

10. CIRCUIT DIAGRAM

10.1 In some instances, as with high density areas, it may not be possible to show design features clearly on central office detail maps because of the congestion which would result. In such cases a circuit diagram overlay may be advisable to supplement the detail map.

10.2 During the past 20 years, circuit diagrams have evolved which show some or all of the following:

- a. Cable sizes and pair counts
- b. Terminal housing locations and size
- c. Loading points
- d. Subscribers
- f. Proposed additions only

10.3 The preparation of circuit diagrams should be limited to those areas where they are required for clarity.

11. APPENDIX

11.1 The Appendix, if any, will include supplemental information and comparative cost studies that are submitted to substantiate particular aspects of the design. Such studies are generally prepared when it is not readily apparent that the recommended design feature has the lowest annual cost or it becomes necessary to evaluate differences in anticipated revenues and expenses. Usual situations requiring comparative studies are ones where the engineer finds it necessary to show that a major design feature is the most desirable, but it is not the usual way of providing service. In the early days of the application of new techniques; that is, when items are in the field trial status, an appendix will normally be required to justify using the unconventional method.

11.2 When an eight-party system is planning to upgrade to a four-party system, then an alternate study should be made to find the additional cost to provide all one-party service.

12. ENGINEER'S WORK SHEETS

12.1 Detailed engineering and economic studies made for various preliminary design approaches which were considered are not intended to be included in the ACD. Studies made by the engineer pursuant to the discussions and agreements at the ACS four-way meeting are expected to be reviewed by the owner and the REA field engineer to determine whether the best overall method of serving the area has been chosen. The engineer's work sheets reflecting the studies should be retained for review by the REA field engineer, or later submission to Washington, if further justification is required in support of the design selected.

12.2 Two examples of the type data to be found in engineer's work papers are included with the sample ACD attached. Exhibits E and F are also examples of work sheet data compiled prior to preparing REA Form 495 for the Supplemental Loan Proposal.

FLAGSTAFF TELEPHONE COMPANY
Flagstaff, Wisconsin

WISCONSIN 699-A

AREA COVERAGE DESIGN

TABLE OF CONTENTS

Exhibit A(1-5)	Narrative
Exhibit B(1-18)	Area Coverage Survey Tabulation
Exhibit C(1-10)	Connecting Company Data
Exhibit D(1)	Summary of Construction Cost
Exhibit E(1)	Central Office Equipment
Exhibit F(1)	Station Equipment Cost
Exhibit G(1-5)	Outside Plant Cost
Exhibit H(1)	Urban-Rural Breakdown - Westover
Exhibit I(1)	Cost Estimate to Upgrade Redstone and Lafayette to All One-Party (Future Loan Application)
Exhibit J(1)	Trunking Diagram
Proposed System Maps	
	Westover Central Office Area
	Westover Town
	Flagstaff Central Office Area
	Flagstaff Town
	Uganda Central Office Area
	Redstone Central Office Area
	Redstone Town
	Lafayette Central Office Area
	Lafayette Town
	Plymouth Central Office Area
	Plymouth Town
	Geneva Central Office Area
	Geneva Town
	Violet Central Office Area
	Violet Town

EXHIBIT A

NARRATIVE

1. GENERAL

- 1.1 The Flagstaff Telephone Company operates seven dial exchanges and one magneto exchange in Victor, Ragland, and Crow Counties in Wisconsin. The headquarters building is in Westover.
- 1.2 The Flagstaff Telephone Company signed an option to acquire the magneto exchange from the Uganda Telephone Company in 1970. Loan funds are required for this acquisition. The exchange area is contiguous to the Lafayette exchange.
- 1.3 The Flagstaff Telephone Company is in the process of upgrading to system-wide all one-party service in three phases.
- 1.4 Phase I is in process to upgrade the Violet, Plymouth, and Geneva exchanges to all one-party service. The outside plant is under contract and should be completed in the Fall of 1971. The central office equipment installations are scheduled for completion in the second quarter of 1971. These three exchanges are scheduled to provide all one-party service in the third quarter of 1971. It appears that the available funds are adequate to complete this construction.
- 1.5 Phase II is this loan application. The primary purpose of this loan will be to upgrade the Westover, Flagstaff, and Uganda exchanges to all one-party service in 1974.
- 1.6 Phase III will be a future loan application to upgrade the Lafayette and Redstone exchanges to all one-party service.
- 1.7 The Lafayette and Redstone exchanges will remain on a one-, two-, four-, and eight-party basis during Phase II. No major construction is contemplated. Only necessary construction funds will be requested. A subscriber poll completed early in 1971 indicated a reluctance to move to all one-party service at this time. Major construction has not taken place in these exchanges since 1967.
- 1.8 The proposed construction, being substantially all-buried, will not have an adverse effect on the environment. No controversy is anticipated. Notices, which included a general description, have been published in a newspaper which has wide circulation in Victor County.

2. SUBSCRIBER DATA

- 2.1 The subscriber data upon which the design is based was developed in the Area Coverage Survey approved January 15, 1971.
- 2.2 The incorporated town of Westover has a population exceeding 1,500. Based on the Area Coverage Survey, there are 695 subscribers within the corporate limits.

2.21 An analysis of funds proposed to be spent within and outside of the corporate limits to benefit the urban and rural subscribers is presented in Exhibit "H".

2.3 The Flagstaff Telephone Company anticipates that approximately 5 percent of the one-party subscribers in 1975 will have a second one-party line.

3. TRUNKING DIAGRAM

3.1 The 5-year toll and extended area service traffic estimates are derived from the projection of measured traffic quantities made by Flagstaff Telephone Company personnel in connection with toll separation studies in 1970. The Muroc Telephone Company has reviewed and concurred in these traffic estimates.

3.2 New extended area service will be provided between Flagstaff Telephone Company's Flagstaff and Lee Telephone Cooperative's Mercury exchanges. Also new extended area service will be provided between the Flagstaff Telephone Company's Flagstaff and Redstone exchanges.

3.3 Flagstaff Telephone Company and the Muroc Company will continue to study the feasibility of a tandem at Muroc for extended area service. This may come about when common control features are added to the Muroc central office. Extended area service trunks to Muroc have been engineered so that the trunk quantities could be expanded to a grade of service of P=.01 which will be required if the tandem arrangement becomes feasible.

4. CONNECTING COMPANY DATA

4.1 Enclosed is a copy of the minutes of a meeting between Muroc Telephone Company and Flagstaff Telephone Company personnel that reflects a full discussion of the new CAMA services (ANI & ONI), transmission requirements (net loss and idle circuit noise), and additions to the operator office and extended area service trunks. Also enclosed is a letter of intent from the Muroc Telephone Company on the above.

4.2 A letter of intent is enclosed from Lee Telephone Cooperative to provide for new extended area service between Flagstaff Telephone Company's Flagstaff exchange and Lee Telephone Cooperative's Mercury exchange. Also a copy of the minutes of a meeting between the company and the cooperative is enclosed that fully discusses this new extended area service trunk group.

5. COST ESTIMATES

5.1 Outside Plant

5.11 The Westover exchange consists of underground cable, buried cable and wire, and a small amount of unjacketed distribution wire. The underground and buried plant was constructed in 1964 to REA specifications to provide five-party rural service and will be reinforced. The distribution wire will be retired because of its high maintenance.

5.12 The Flagstaff exchange was constructed in 1956 in accordance with REA specifications to provide eight-party rural service. The aerial construction included pressure treated poles, grade 135 steel wire, and noncolor coded plastic cable. This plant was reinforced with buried cable and buried wire in 1964, and eight-party rural service was maintained. Because of (1) long span construction, (2) inadequate pole strength, (3) joint use problems, and (4) high right-of-way maintenance expenses; engineering studies prove that it is more economical to retire the aerial facilities and reinforce the existing buried plant to meet the 5-year requirements.

5.13 The Uganda exchange consists of open wire and nonjacketed distribution wire facilities. The average age of the outside plant is 15 years. The distribution wire is in very poor condition due to poor installation and maintenance practices. The open wire plant consists of many miles of single circuit bracket type construction. A high percentage of the poles are nonpressure treated type and are in varying stages of deterioration. The Uganda exchange will be completely replaced with buried plant.

5.14 Lafayette and Redstone will remain on an eight-party rural service basis until 1977. Therefore, only funds required for construction in the next 5-year period to add new subscribers and allow a modest amount of upgrading are provided in these two exchanges. Construction necessary in the interim will be engineered for the future all one-party requirements.

5.15 Buried cable shield thickness will be 5 mil copper or equivalent, since no rodent or corrosion problems have been experienced with the existing 5-mil buried plant.

5.2 Central Office Equipment

5.21 The Westover central office will be expanded to meet its 5-year subscriber and trunking demands with equipment which will be purchased through negotiation with the RST Company.

5.22 The terminal-per-line equipment at Flagstaff and the magneto equipment at Uganda will be replaced by terminal-per-station equipment.

- 5.23 The Redstone exchange will be expanded to meet its 5-year requirements with equipment that is to be retired from the Violet exchange.
- 5.24 A small CMO group is being added to the Lafayette office to meet its 5-year requirements.
- 5.25 CAMA trunks will be installed for the first time in Westover, Flagstaff, Uganda, Lafayette, and Redstone. Circle digit type ANI was considered for Lafayette and Redstone. One-party ANI is proposed. Party lines will receive operator identification until upgraded to one-party.
- 5.26 All existing extended area service conversation timing is to be discontinued. However, conversation timing will remain on subscriber lines in the Lafayette and Redstone exchanges because eight-party service is still to be provided.
- 5.27 Funds for a multifrequency milliwatt generator, quiet termination, stability test, and loop around for transmission testing of subscriber loops and trunks are required.
- 5.28 PCM type carrier was chosen for the Westover, Lafayette, and Uganda exchanges because of its lower cost, the possibility of data circuits, and its compatibility with station carrier in the same cable.
- 5.3 Station Equipment
- 5.31 Funds are required for new station installations and also to replace the existing magneto installations at Uganda.
- 5.32 Funds are required for additional services over and above the number of 5-year subscribers. Additional station protectors, drops, inside wire, etc., result from idle services. There are approximately 4 percent idle services in the overall system.
- 5.4 Land and Buildings
- 5.41 The Westover headquarters building is considered adequate to meet future needs. The central office equipment area was originally designed for 3,000 lines ultimate capacity. Therefore, the additional equipment required can be easily accommodated.
- 5.42 The Flagstaff and Uganda exchanges will require a new CDO building. Lots will be purchased for the new buildings, since the existing lots are too small for the overall requirements.
- 5.43 The existing lots and buildings in Uganda and Flagstaff will be sold.

5.44 Standby generator funds are required for the Westover, Flagstaff, Uganda, and Lafayette exchanges. Standby generators for Plymouth and Geneva and a portable unit for Violet are being provided. The portable unit will be shared with Redstone since both of these offices may be eliminated within 10 years.

5.5 Vehicles and Work Equipment

5.51 An additional three-quarter ton truck is to be purchased for an additional installer-repairman. All other vehicles will be retained.

5.52 Funds for a noise measuring test set, eight loop checkers, and a span and repeater test set are required. Company practice is that every new subscriber and any existing subscriber with complaints about transmission will have the subscriber loop measured for actual measured loss.

5.53 Funds for two cable locators and one cable fault locator are required for maintenance of buried plant. Funds are also required for one lawn plow and trencher with trailer for buried plant additions.

5.54 Funds are required to purchase remote subscriber line test equipment for all eight exchanges. The master unit will be installed at Westover.

5.6 Furniture and Office Equipment

5.61 Funds are required for office equipment for an additional clerk.

6. Certification:

We, the undersigned, certify that the data in this Area Coverage Design are correct to the best of our knowledge and belief, and reasonably reflect the costs to serve the subscribers as proposed on the Forms 569, Area Coverage Survey, which are integral parts hereof.

Joseph Doakes
Smith Engineering Co., Partner

4-27-71
Date

James Jones
Flagstaff Telephone Co., Manager

4/27/71
Date

Arthur Small
REA Loan and Operations
Field Representative

4-27-71
Date

John Wilson
REA Field Engineer

4-27-71
Date

USDA - REA		Form Approved OMB No. 10-R2647		NAME OF LOAN APPLICANT FLAGSTAFF TELEPHONE COMPANY											
AREA COVERAGE SURVEY REPORT		LOAN APPLICATION DESIGNATION WISCONSIN 699-A													
INSTRUCTIONS • Prepare original and 4 copies. Complete Page 2 only in cases stated at top of that page. For further instructions see REA Bulletin 322-1 or Section 206, Telephone Engineering and Construction Manual.		NAME OF CENTRAL OFFICE SYSTEM SUMMARY													
PART A. AREA COVERAGE DATA															
1. TOTAL NUMBER OF EXISTING ESTABLISHMENTS. (<input type="checkbox"/> Estimated, <input checked="" type="checkbox"/> Based on Field Survey)												4752			
2. NUMBER OF EXISTING INHABITED ESTABLISHMENTS. (<input type="checkbox"/> Estimated, <input checked="" type="checkbox"/> Based on Field Survey)												4561			
3. PERCENT OF EXISTING INHABITED ESTABLISHMENTS WITH SERVICE. (Part B, Item 1, "Total Subscribers" Col. - Part A, Item 2)												77%			
4. ESTIMATED NUMBER OF FUTURE ESTABLISHMENTS.												163			
PART B. PROPOSED CENTRAL OFFICE AREA															
SOURCE OF SERVICE REQUIREMENTS	TOTAL SUBSCRIBERS	BUSINESS						RESIDENCE						EXTENSION	
		1 PARTY	2 PARTY	4 PARTY	RURAL (8*)	PAY STA.	OTHER SUBS.	1 PARTY	2 PARTY	4 PARTY	RURAL (8*)	OTHER SUBS.	SER-VICE STA.	BUS.	RES.
1. PRESENT SUBSCRIBERS AS OF (Date) 12/31/70	3507	267	18	-	24	26	5	1087	279	187	1614	-		187	349
2. LINE 1 ADJUSTED FOR REGRADES	3507	286	6	-	7	26	15	2383	10	191	441	142		187	405
3. HELD ORDERS	47	6	-	-	-	-	-	29	-	3	6	3		5	12
4. NEW SUBS. FROM EXISTING ESTABLISHMENTS	637	68	6	-	-	5		475	7	19	29	28		69	124
5. NEW SUBS. FROM FUTURE ESTABLISHMENTS	161	23	2	-	-	6	1	110	3	3	1	12		7	41
6. TOTAL ESTABLISHMENTS TO BE CONNECTED	4352	383	14	-	7	37	16	2997	20	216	477	185		268	582
7. ANTICIPATED OUTWARD MOVEMENT	132	17	-	-	-	-	-	93	-	4	18	-		8	12
8. TOTAL 5 YEAR SUBSCRIBERS	4220	366	14	-	7	37	16	2904	20	212	459	185		260	570
9. GRADED SERVICE OUTSIDE B.R.A.			6					7	12						
10. AVERAGE MILEAGE OUTSIDE B.R.A.			3/4					1/2	1						
REMARKS															
<p>*Existing 8-Party Rural Residence includes 538 5-Party subscribers in the Westover exchange.</p> <p>Note: Three of the mobile dial subscribers shown on Page 2 reside in the service area of the Muroc Telephone Company, but Muroc does not provide mobile service.</p>															
SIGNATURES												DATE			
1. FOR THE APPLICANT <i>James Jones</i>												1/15/71			
2. REA LOANS AND OPERATIONS FIELD REPRESENTATIVE <i>Arthur Small</i>												1-15-71			
3. REA FIELD ENGINEER <i>John Wilson</i>												1-15-71			

AREA COVERAGE SURVEY REPORT (Cont'd)

LOAN APPLICATION DESIGNATION

NAME OF CENTRAL OFFICE

WISCONSIN 699-A

SYSTEM SUMMARY

NOTE: Complete this page in cases where the system has or proposed to have:

1 Key Systems (Part C)

3. Radio Telephone Service (Part E)

2 PBX Systems (Part D)

4 Other revenue producing services not shown elsewhere.

(The systems included in Parts C and D should be transferred to the "Other Subscriber" column on Page 1, Part B. The number of extensions shown in Part C and D should be included under the appropriate "Extension" columns on Page 1, Part B.)

PART C. KEY SYSTEMS

EXISTING			PROPOSED (including existing)		
NO. OF SYSTEMS	LINEs	EXTENSIONS	NO. OF SYSTEMS	LINEs	EXTENSIONS
1	4	13	1	4	13
-	-	-	1	3	10
1	2	6	1	2	6
-	-	-	130	2	2 ea. 260 Total
-	-	-	65	2	3 ea. 195 Total

PART D. PBX SYSTEMS

EXISTING				PROPOSED (including existing)			
NO. OF SYSTEMS	TRUNKS	EXTENSIONS	OPERATION	NO. OF SYSTEMS	TRUNKS	EXTENSIONS	OPERATION
1	4	20	PBX	1	5	25	PBX
1	4	30	PABX	1	4	30	PABX
1	3	13	PBX	1	4	19	PBX

PART E. RADIO TELEPHONE

EXISTING			PROPOSED (including existing)		
NO. OF SYSTEMS	SUBSCRIBERS	OFFICIAL STATIONS	NO. OF SYSTEMS	SUBSCRIBERS	OFFICIAL STATIONS
1	8	10	1	13	4
-	-	-	1	-	7

PART F. ADDITIONAL REVENUE PRODUCING SERVICES

EXISTING			PROPOSED (including existing)		
DESCRIPTION	NUMBER	REVENUE	DESCRIPTION	NUMBER	REVENUE
-	-	-	202 Data Set	1	\$336/yr.
-	-	-	4.5 Minute Facsimile Set	1	\$840/yr.

USDA - REA		Form Approved OMB No. 40-R2647		NAME OF LOAN APPLICANT FLAGSTAFF TELEPHONE COMPANY																																						
AREA COVERAGE SURVEY REPORT		LOAN APPLICATION DESIGNATION WISCONSIN 699-A																																								
INSTRUCTIONS - Prepare original and 4 copies. Complete Page 2 only in cases stated at top of that page. For further instructions see REA Bulletin 322-1 or Section 206, Telephone Engineering and Construction Manual.		NAME OF CENTRAL OFFICE WESTOVER																																								
PART A. AREA COVERAGE DATA																																										
1. TOTAL NUMBER OF EXISTING ESTABLISHMENTS. (<input type="checkbox"/> Estimated, <input checked="" type="checkbox"/> Based on Field Survey)												1374																														
2. NUMBER OF EXISTING INHABITED ESTABLISHMENTS. (<input type="checkbox"/> Estimated, <input checked="" type="checkbox"/> Based on Field Survey)												1289																														
3. PERCENT OF EXISTING INHABITED ESTABLISHMENTS WITH SERVICE. (Part B, Item 1, "Total Subscribers" Col. - Part A, Item 2)												91%																														
4. ESTIMATED NUMBER OF FUTURE ESTABLISHMENTS.												30																														
PART B. PROPOSED CENTRAL OFFICE AREA																																										
SOURCE OF SERVICE REQUIREMENTS	TOTAL SUBSCRIBERS	BUSINESS						RESIDENCE					SERV-ICE STA.	EXTENSION																												
		1 PARTY	2 PARTY	4 PARTY	RURAL ()	PAY STA.	OTHER SUBS.	1 PARTY	2 PARTY	4 PARTY	RURAL ()	OTHER SUBS.		BUS.	RES.																											
1. PRESENT SUBSCRIBERS AS OF (Date) 12/31/70	1174	82	15		-	6	4	262	267	-	538	-		121	185																											
2. LINE 1 ADJUSTED FOR REGRADES	1174	98	-	-	-	6	13	1031	-	-	-	26		150	280																											
3. HELD ORDERS	19	3	-	-	-			14	-	-	-	2		3	4																											
4. NEW SUBS. FROM EXISTING ESTABLISHMENTS	145	10	-	-	-			122	-	-	-	13		6	70																											
5. NEW SUBS. FROM FUTURE ESTABLISHMENTS	30	3	-	-	-	2	1	19	-	-	-	5		1	20																											
6. TOTAL ESTABLISHMENTS TO BE CONNECTED	1368	114	-	-	-	8	14	1186	-	-	-	46		160	374																											
7. ANTICIPATED OUTWARD MOVEMENT	38	2	-	-	-	-	-	36	-	-	-	-		-	14																											
8. TOTAL 5 YEAR SUBSCRIBERS	1330	112	-	-	-	8	14	1150	-	-	-	46		160	360																											
9. GRADED SERVICE OUTSIDE B.R.A.																																										
10. AVERAGE MILEAGE OUTSIDE B.R.A.																																										
REMARKS The incorporated town of Westover has a population exceeding 1,500. Based on the Area Coverage Survey, there are 695 subscribers within the corporate limits as shown below:																																										
<table style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;"><u>Existing</u></td> <td style="text-align: center;"><u>Proposed</u></td> </tr> <tr> <td>1-Party Business</td> <td style="text-align: center;">83</td> <td style="text-align: center;">110</td> </tr> <tr> <td>2-Party Business</td> <td style="text-align: center;">15</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Pay Station</td> <td style="text-align: center;">6</td> <td style="text-align: center;">8</td> </tr> <tr> <td>Other Business</td> <td style="text-align: center;">3</td> <td style="text-align: center;">6</td> </tr> <tr> <td>1-Party Residence</td> <td style="text-align: center;">244</td> <td style="text-align: center;">536</td> </tr> <tr> <td>2-Party Residence</td> <td style="text-align: center;">251</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Other Residence</td> <td style="text-align: center;">--</td> <td style="text-align: center;">35</td> </tr> <tr> <td></td> <td style="text-align: center;"><u>602</u></td> <td style="text-align: center;"><u>695</u></td> </tr> </table>																	<u>Existing</u>	<u>Proposed</u>	1-Party Business	83	110	2-Party Business	15	--	Pay Station	6	8	Other Business	3	6	1-Party Residence	244	536	2-Party Residence	251	--	Other Residence	--	35		<u>602</u>	<u>695</u>
	<u>Existing</u>	<u>Proposed</u>																																								
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SIGNATURES												DATE																														
1. FOR THE APPLICANT <i>James Jones</i>												1/15/71																														
2. REA LOANS AND OPERATIONS FIELD REPRESENTATIVE <i>Arthur Small</i>												1-15-71																														
3. REA FIELD ENGINEER <i>John Wilson</i>												1-15-71																														

COMPLETED REA FORMS 569, AREA COVERAGE SURVEY
TABULATION, WOULD ALSO BE INCLUDED FOR THE
FOLLOWING REMAINING EXCHANGES:

FLAGSTAFF

UGANDA

REDSTONE

LAFAYETTE

PLYMOUTH

GENEVA

VIOLET

USDA - REA		Form Approved OMB No. 40-R2591		DATE			
FUNDAMENTAL PLAN INFORMATION				February 18, 1971			
INSTRUCTIONS (See REA Bulletin 340-3)							
<p>1. Submit one copy to connecting company and include one copy with each copy of the Area Coverage Design.</p> <p>2. Unless otherwise indicated under "Remarks" the following will always be standard:</p> <ul style="list-style-type: none"> a. Dial switchboards conform to REA specifications. b. No change in toll center planned. c. All vacant levels, changed and unassigned numbers are intercepted. d. Operator office service required from toll center for assisting subscribers, information, verification, intercept, emergency calls, complaints and trouble reports, and alarm signal reporting. e. Unless otherwise indicated office is Class 5. f. Automatic number identification furnished the toll center. g. Milliwatt supply available for trunk testing. h. Paystations in the "9xxx" series. 							
1. NAME OF COMPANY PREPARING FORM Flagstaff Telephone Company				2. REA PROJECT DESIGNATION Wisconsin 699-A			
3. NAME AND ADDRESS OF ENGINEER Smith Engineering Company P. O. Box 102, Rome, Wisconsin 54608				4. NAME OF OTHER TELEPHONE COMPANY Muroc Telephone Company Lee Telephone Cooperative West State Telephone Company			
I. NAME OF EXCHANGE (By location) AND THREE DIGIT OFFICE CODES FOR OFFICES OF COMPANY PREPARING THIS FORM →		West- over	Flag- staff	Uganda	Red- stone	La- fayette	Ply- mouth
		634	675	528	629	625	648
II. PROPOSED - IN SERVICE DATE FOR NEW TRUNKS (Month and Year)		Jan. 1974	Feb. 1974	Feb. 1974	March 1974	March 1974	Sept. 1971
III. MAIN TELEPHONES	A. PRESENT NUMBER	1174	260	122	219	608	438
	B. NUMBER AS OF IN SERVICE DATE IN SECTION II ABOVE	1250	300	170	240	700	460
	C. ESTIMATED NUMBER 5 YR. (12-31-19 75)	1330	310	190	280	730	540
	D. ESTIMATED NUMBER 10 YR. (12-31-19 80)	1520	370	220	360	880	620
IV. CCO EQUIPMENT DATA	A. DATE OF MANUFACTURE OF SWITCHBOARD (Year)	1962	1973	1973	1962	1961	1965
	B. COMMON CONTROL CAPABILITY (Check)	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
REMARKS CAMA service for Redstone and Lafayette 2-to 8-party will be ONI. All other CAMA will be ANI.							

V. TOLL TRUNK DATA

NOTE: The present, in service, 5 year and 10 year dates are as shown in Section II and III, Page 1.

NAME OF EXCHANGE		West-over	Flag-staff	Uganda	Redstone	Lafayette	Plymouth	
A. NAME OF OPERATOR OFFICE		← MUROC →						
B. NO.	OPERATOR OFFICE, 2-WAY	PRESENT	12	5	3	5	8	7
		ON IN SERVICE DATE	12	6	6	7	9	10
		5-YEAR	12	6	6	7	9	10
		10-YEAR	12	8	8	8	9	10
OF TRUNKS TO TOLL CENTER	CAMA	PRESENT	-	-	-	-	-	-
		ON IN SERVICE DATE	11	5	5	5	6	8
		5-YEAR	11	5	5	5	6	8
		10-YEAR	15	7	6	7	9	10
OTHER TRUNK GROUPS (Specify type below)								
1. Toll-1 Way In		PRESENT	-	-	-	-	-	-
		ON IN SERVICE DATE	4	-	-	-	-	-
		5-YEAR	4	-	-	-	-	-
		10-YEAR	8	-	-	-	3	3
2. FX		PRESENT	1	-	-	-	-	-
		ON IN SERVICE DATE	1	-	-	-	-	-
		5-YEAR	2	-	-	-	-	-
		10-YEAR	4	-	-	-	-	-
3.		PRESENT	-	-	-	-	-	-
		ON IN SERVICE DATE	-	-	-	-	-	-
		5-YEAR	-	-	-	-	-	-
		10-YEAR	-	-	-	-	-	-
C. ROUTE MILES OF PROPOSED TRUNKS TO TOLL CENTER	1. TOTAL	7.9	6.3	22.0	11.9	16.0	24.5	
	2. "OTHER" CO OWNED	3.0	2.4	9.0	4.9	9.0	2.4	
	3. JUNCTION LOCATION	← SYSTEM BOUNDARY →						
D. WILL ANY EAS BE DISCONTINUED?	YES							
	NO	X	X	X	X	X	X	

VI. EXTENDED AREA SERVICE (Inter- and Intra- System)

NOTE: The present, in service, 5 year and 10 year dates are as shown in Section II and III, Page 1.

NAME OF EXCHANGE		West-over	Flag-staff	Uganda	Red-stone	La-fayette	Ply-mouth	
A. LIST CONNECTING OFFICES AND OWNERSHIP OF EACH (Items 1 thru 5 below)								
1. Muroc Muroc Tel. Co.	NO. OF TRUNKS	PRES.	16	8	-	4	6	5
		IN SERV.	20	8	-	4	6	6
		5 YR.	20	8	-	4	6	6
		10 YR.	25	10	-	6	9	8
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		7.9	6.3	-	11.9	16.0	24.5
	(b) ROUTE MILES OWNED CO. 1		3.0	2.4	-	4.9	9.0	2.4
2. Lafayette Flagstaff Tel. Co.	NO. OF TRUNKS	PRES.	4	-	4	-	-	-
		IN SERV.	6	-	4	-	-	-
		5 YR.	6	-	5	-	-	-
		10 YR.	8	-	6	-	-	-
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		13.0	-	12.0	-	-	-
	(b) ROUTE MILES OWNED CO. 2		13.0	-	12.0	-	-	-
3. Flagstaff Flagstaff Tel. Co.	NO. OF TRUNKS	PRES.	-	-	-	-	-	6
		IN SERV.	-	-	-	4	-	6
		5 YR.	-	-	-	4	-	6
		10 YR.	-	-	-	5	-	8
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		-	-	-	9.6	-	16.2
	(b) ROUTE MILES OWNED CO. 3		-	-	-	9.6	-	16.2
4. Mercury Lee Tel. Coop.	NO. OF TRUNKS	PRES.	-	-	-	-	-	-
		IN SERV.	-	4	-	-	-	-
		5 YR.	-	4	-	-	-	-
		10 YR.	-	5	-	-	-	-
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		-	11.1	-	-	-	-
	(b) ROUTE MILES OWNED CO. 4		-	6.6	-	-	-	-
5. Saber Lee Tel. Coop.	NO. OF TRUNKS	PRES.	-	-	-	3	-	-
		IN SERV.	-	-	-	6	-	-
		5 YR.	-	-	-	6	-	-
		10 YR.	-	-	-	8	-	-
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		-	-	-	9.4	-	-
	(b) ROUTE MILES OWNED CO. 5		-	-	-	4.4	-	-
B. ARE THERE ANY TANDEM ARRANGEMENTS? (If yes, explain under "Remarks")		YES						
		NO	X	X	X	X	X	X
REMARKS								

USDA - REA		Form Approved OMB No. 40-R2591		DATE			
FUNDAMENTAL PLAN INFORMATION				February 18, 1971			
INSTRUCTIONS (See REA Bulletin 340-3)							
<p>1. Submit one copy to connecting company and include one copy with each copy of the Area Coverage Design.</p> <p>2. Unless otherwise indicated under "Remarks" the following will always be standard:</p> <ul style="list-style-type: none"> a. Dial switchboards conform to REA specifications. b. No change in toll center planned. c. All vacant levels, changed and unassigned numbers are intercepted. d. Operator office service required from toll center for: assisting subscribers, information, verification, intercept, emergency calls, complaints and trouble reports, and alarm signal reporting. e. Unless otherwise indicated office is Class 5. f. Automatic number identification furnished the toll center. g. Milliwatt supply available for trunk testing. h. Paystations in the "9xxx" series. 							
1. NAME OF COMPANY PREPARING FORM Flagstaff Telephone Company				2. REA PROJECT DESIGNATION Wisconsin 699-A			
3. NAME AND ADDRESS OF ENGINEER Smith Engineering Company P. O. Box 102, Rome, Wisconsin 54608				4. NAME OF OTHER TELEPHONE COMPANY Muroc Telephone Company Lee Telephone Coop. West State Tel. Co.			
I. NAME OF EXCHANGE (By location) AND THREE DIGIT OFFICE CODES FOR OFFICES OF COMPANY PREPARING THIS FORM →		Geneva 689	Violet 627				
II. PROPOSED - IN SERVICE DATE FOR NEW TRUNKS (Month and Year)		Oct. 1971	Nov. 1971				
III. MAIN TELEPHONES	A. PRESENT NUMBER	304	382				
	B. NUMBER AS OF IN SERVICE DATE IN SECTION II ABOVE	330	410				
	C. ESTIMATED NUMBER 5 YR. (12-31-1975)	390	450				
	D. ESTIMATED NUMBER 10 YR. (12-31-1980)	460	530				
IV. CDO EQUIPMENT DATA	A. DATE OF MANUFACTURE OF SWITCHBOARD (Year)	1965	1971				
	B. COMMON CONTROL CAPABILITY (Check)	YES NO	X X				
REMARKS							

V. TOLL TRUNK DATA

NOTE: The present, in service, 5 year and 10 year dates are as shown in Section II and III, Page 1.

NAME OF EXCHANGE		Geneva	Violet				
A. NAME OF OPERATOR OFFICE		Murco					
B. NO. OF TRUNKS TO TOLL CENTER	OPERATOR OFFICE, 2-WAY	PRESENT	12	6			
		ON IN SERVICE DATE	12	7			
		8-YEAR	12	7			
		10-YEAR	12	9			
	CAMA	PRESENT	-	-			
		ON IN SERVICE DATE	10	6			
		8-YEAR	10	6			
		10-YEAR	12	8			
	OTHER TRUNK GROUPS (Specify type below)						
	1. Incom-ing Toll	PRESENT	-	-			
		ON IN SERVICE DATE	1	-			
		8-YEAR	1	-			
		10-YEAR	3	-			
	2. TWX	PRESENT	-	-			
		ON IN SERVICE DATE	2	-			
		8-YEAR	2	-			
10-YEAR		3	-				
3.	PRESENT	-	-				
	ON IN SERVICE DATE	-	-				
	8-YEAR	-	-				
	10-YEAR	-	-				
C. ROUTE MILES OF PROPOSED TRUNKS TO TOLL CENTER	1. TOTAL	21.1	11.8				
	2. "OTHER" CO. OWNED	9.0	7.6				
	3. JUNCTION LOCATION	SYSTEM BOUNDARY					
D. WILL ANY EAS BE DISCONTINUED?	YES						
	NO	X	X				

VI. EXTENDED AREA SERVICE (Inter- and Intra- System)

NOTE: The present, in service, 5 year and 10 year dates are as shown in Section II and III, Page 1.

NAME OF EXCHANGE		Geneva	Violet				
A. LIST CONNECTING OFFICES AND OWNERSHIP OF EACH (Items 1 thru 5 below)							
1. Muroc Muroc Tel. Co.	NO. OF TRUNKS	PRES.	6	6			
		IN SERV.	6	6			
		5 YR.	6	6			
		10 YR.	8	7			
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		21.1	11.8			
	(b) ROUTE MILES OWNED CO. 1		9.0	7.6			
6. Plymouth Flagstaff Tel. Co.	NO. OF TRUNKS	PRES.	6	-			
		IN SERV.	6	-			
		5 YR.	6	-			
		10 YR.	8	-			
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		10.0	-			
	(b) ROUTE MILES OWNED CO. 6		10.0	-			
7. Stanley West State Tel. Co.	NO. OF TRUNKS	PRES.	4	-			
		IN SERV.	4	-			
		5 YR.	4	-			
		10 YR.	5	-			
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		5.5	-			
	(b) ROUTE MILES OWNED CO. 7		3.0	-			
5. Saber Lee Tel. Coop.	NO. OF TRUNKS	PRES.	-	7			
		IN SERV.	-	7			
		5 YR.	-	7			
		10 YR.	-	8			
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES		-	7.2			
	(b) ROUTE MILES OWNED CO. 5		-	3.2			
5.	NO. OF TRUNKS	PRES.					
		IN SERV.					
		5 YR.					
		10 YR.					
TRUNK OWNERSHIP	(a) TOTAL ROUTE MILES						
	(b) ROUTE MILES OWNED CO. 5						
B. ARE THERE ANY TANDEM ARRANGEMENTS? (If yes, explain under "Remarks")		YES					
		NO	X	X			
REMARKS							

WEST STATE TELEPHONE COMPANY
Middle River, Wisconsin

February 7, 1971

Mr. J. Jones, Manager
Flagstaff Telephone Company
Flagstaff, Wisconsin

Dear Mr. Jones:

With reference to our telephone conversation on February 5, 1971, this will confirm the agreement reached that the four (4) extended area service trunks between our Stanley exchange and your Geneva exchange are providing a mutually acceptable grade of service. It was further agreed that the size of this trunk group would be increased as appropriate if and when justified by demand.

In view of the above, I shall not attend the connecting company conference meeting scheduled for February 10, 1971, in the office of the Muroc Telephone Company.

Sincerely yours,



S. Palmer, Manager

EXHIBIT E

CONNECTING COMPANY CONFERENCE MEETINGWISCONSIN 699-A FLAGSTAFFConferees:

J. Jones, Manager, Flagstaff Telephone Company
I. Brooks, Manager, Lee Telephone Cooperative
J. Doakes, Doakes and Company, Engineers
L. White, Manager, Muroc Telephone Company
J. Wilson, REA Field Engineer
A. Small, REA Field Representative

The conference was held February 10, 1971, in the office of the Muroc Telephone Company to discuss interconnections between the systems. In earlier discussions with the Muroc Telephone Company the Flagstaff Telephone Company had expressed the need for additional operator office and extended area service trunking between its exchanges and Muroc. Also, a request had been made for the provision of Centralized Automatic Message Accounting (CAMA) Service from Muroc. Mr. White had on hand preliminary studies based on traffic measurements and analyses which the Muroc Telephone Company had performed concerning toll trunking, extended area service trunking, and CAMA trunks to Muroc. It was agreed that the Flagstaff Telephone Company would install ANI equipment in all of its exchanges, but ONI would be provided party lines in Lafayette and Redstone. He stated that Muroc would handle CAMA for the Flagstaff system. The additional circuits needed between Muroc and Westover, Lafayette and Uganda for the toll, extended area service, and CAMA trunks will be derived through the use of PCM carrier with each company furnishing the necessary equipment in its own territory. Mr. Jones concurred in the recommended increases in the sizes of the toll and extended area service trunk groups.

Messrs. Jones and Brooks then proceeded to discuss extended area service calling between their companies. Recent independent postcard surveys of subscribers in Flagstaff and Mercury showed conclusively that extended area service between these two exchanges was definitely desired. Anticipated calling between the exchanges which had been estimated independently by each company was considered, and agreement was reached that four trunks should be installed initially subject to such increases as might become necessary. Mr. Jones and Mr. Brooks also reviewed the need for increasing the size of the Redstone - Saber EAS trunk group. After reviewing traffic measurements which had been made at both offices, they concurred that the group should be increased from four to six trunks. Mr. Brooks will submit contracts to the Flagstaff Telephone Company covering this trunking. Mr. Doakes is to prepare and distribute REA Forms 809, as necessary and appropriate, to reflect the agreements arrived at during the meeting.

LEE TELEPHONE COOPERATIVE
Rapid Falls, Wisconsin

February 24, 1971

Mr. J. Jones, Manager
Flagstaff Telephone Company
Flagstaff, Wisconsin

Dear Mr. Jones:

This is to confirm our discussion during the joint meeting of connecting companies on February 10, 1971, in the office of the Muroc Telephone Company, Muroc, Wisconsin.

Agreement was reached between us that extended area service would be established between our Mercury exchange and your Flagstaff exchange. We also agreed to increasing the number of extended area service trunks currently existing between Redstone and Saber.

Mr. Doakes, your consulting engineer, has mailed us REA Forms 809 and copies of the data concerning the equipment and facilities for the trunk groups. We have no changes to recommend.

Pursuant to the above, the following documents are enclosed for your review and action:

1. Extended Area Service Agreement, Flagstaff - Mercury--3 copies
2. Extended Area Service Agreement, Flagstaff - Saber--3 copies
3. Letter Concerning Repeater Agreements
4. REA Form 809--1 copy

We trust these meet with your approval.

Sincerely yours,



Ira Brooks, Manager

MUROC TELEPHONE COMPANY
Muroc, Wisconsin

February 26, 1971

Mr. J. Jones, Manager
Flagstaff Telephone Company
Flagstaff, Wisconsin

Dear Mr. Jones:

We have reviewed the minutes of the meeting of February 10, 1971, and the revised Forms 809 dated February 18, 1971, and have no changes to recommend.

The Muroc Telephone Company will handle toll traffic and CAMA service for the Flagstaff Telephone Company. It was agreed that the additional trunks required between Westover, Lafayette, Uganda, and Muroc for these purposes as well as EAS will be derived through the use of PCM carrier with each company furnishing the equipment and facilities necessary in its own territory. For settlement purposes, we shall continue to base settlement on toll separation studies.

It was also agreed that your company will install ANI equipment in all of the exchanges of your system, but ONI will be provided party lines in Lafayette and Redstone.

On jointly owned circuits, it is our practice to prorate the annual costs of voice and carrier frequency repeaters on the basis of the loss (at the frequencies involved) in each company's facilities. Our annual charge for electronic equipment is approximately 25 percent of the first cost plus power and floor space rental. We presume your charges will be about the same.

Sincerely yours,



R. Black, Vice President

EXHIBIT "D" - SUMMARY OF CONSTRUCTION COSTS

	<u>WESTOVER</u>	<u>FLAGSTAFF</u>	<u>UGANDA</u>	<u>REDSTONE</u>	<u>LAFAYETTE</u>	<u>PLYMOUTH</u>	<u>GENEVA</u>	<u>VIOLET</u>	<u>SYSTEM</u>
Land	-	\$ 1,000	\$ 1,000	-	-	-	-	-	
Buildings - New	-	18,000*	13,000**	-	-	-	-	-	
Building - Additions	-	-	-	-	\$ 1,600***	-	-	-	
Land and Buildings - Total		\$ 19,000	\$ 14,000		\$ 1,600				\$ 34,600
Central Office Equipment	\$166,700	\$ 72,500	\$ 69,000	\$ 25,400	\$ 67,700	\$ 3,300****	\$ 3,300****	\$ 3,300****	\$411,200
Station Equipment	29,600	9,200	21,900	10,400	24,300	13,900	10,700	8,900	128,900
Outside Plant	147,200	108,900	63,500	12,800	28,600	8,100	6,200	4,100#	379,400
Mobile Radio Service									10,800
Vehicles and Work Equipment and Test Equipment									12,600
Office Equipment									700
Preloan Engineering									9,100
Postloan Engineering									71,400
Removal Cost (Nonreusable Material)	500	5,000	2,000	200	400	-	-	-	8,100
R/W Procurement	700	500	1,300	100	200	-	-	-	2,800
Total	\$344,700	\$215,100	\$171,700	\$ 48,900	\$122,800	\$ 25,300	\$ 20,200	\$ 16,300	\$1,069,600@

Route Miles of Plant (Mileage
Includes Drops)

Existing-Retained As Is	163.8 (44.5)	57.9 (4.9)	- 0 -	44.0 (8.3)	68.2 (23.0)	113.5 (17.4)	68.1 (12.5)	85.3 (15.5)	600.8 (126.1)
Modifications	91.8 (1.2)	75.9 (4.9)	34.6 (4.6)	15.0 (0.0)	49.0 (0.0)	14.4 (0.0)	9.2 (0.0)	12.7 (0.0)	302.6 (10.7)
New	23.2 (6.1)	16.9 (1.9)	25.6 (2.6)	11.3 (2.3)	9.6 (4.6)	10.7 (3.0)	8.2 (2.3)	5.8 (1.5)	111.3 (24.3)
Retired	-3.6 (0.0)	-	-	-	-	-	-	-	-3.6 (0.0)
Total Mileage	275.2 (51.8)	150.7 (11.7)	60.2 (7.2)	70.3 (10.6)	126.8 (27.6)	138.6 (20.4)	85.5 (14.8)	103.8 (17.)	1011.1 (161.1)

Original Cost of Plant Retired

Central Office Equipment	-	\$ 44,000	\$ 300	-	-	-	-	-	
Land and Buildings	-	13,900	3,400	-	-	-	-	-	
Station Equipment	\$ 700	2,200	5,300	-	-	-	-	-	
Outside Plant	4,500	101,200	27,400	3,100	7,000	-	-	-	
Exchange Total	\$ 5,200	\$161,300	\$ 36,400	\$ 3,100	\$ 7,000				
Salvage	-	\$ 22,600	\$ 3,000	-	-	-	-	-	
EAS to be Established With This Loan	-	\$ 8,500###	-	\$ 2,900###	-	-	-	-	

* 720 Sq. Ft. @ \$25
 ** 520 Sq. Ft. @ \$25
 ***40 Sq. Ft. @ \$40
 ****Remote Subscriber Line Test Equipment

Extensions and Minor Modifications
 ## Dispatch Type Mobile Radio Installation
 ###Flagstaff to Mercury; Flagstaff to Red Stone

@Includes \$104,600 Not in Exchange Columns

EXHIBIT E - CENTRAL OFFICE EQUIPMENT

UNIT COST	WESTOVER		FLAGSTAFF		UGANDA		REDSTONE		LAFAYETTE		
	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	
<u>EXISTING</u>											
Equipped Lines & Terminals		700-1300		160-160		30-30		120-120		300-700	
Manufacturer		RST Co.		DEF Co.		G. Co.		DEF Co.		DEF Co.	
Date of Manufacture		1964		1957		1930		1962		1961	
TPS or TPL		TPS		TPL		Magneto		TPL		TPL	
C.O. Resistance Limit		1500 ohms		1200 ohms		600 ohms		1200 ohms		1200 ohms	
<u>PROPOSED</u>											
TPL (Lines-Terminals)	-	-	-	-	-	-	-	170-170*	\$ 2,500**	-	
TPS (Lines-Terminals)	-	800-300	\$ 76,000	320-400	\$33,600	210-300	\$26,200	-	-	20-100	\$ 5,800
Trunks, Toll Operator Office	\$ 350			6	2,100	6	2,100	2	-**	1	350
Trunks, Toll Incoming	200	4	800	-	-	-	-	-	-	-	-
Trunks, Toll, CAMA	200	11	2,200	5	1,000	5	1,000	5	1,000	6	1,200
Trunks, EAS	350	6	2,100	22	7,700	5	1,750	7	-**	5	1,750
Channel End, PCM Carrier	-	22	12,600	-	-	11	16,500	-	-	23	17,800
Channel End-Carrier	-	-	-	-	-	-	-	7	400***	-	-
Mfd. by "J" Company											
Station Carrier (Channels)	380	135	51,300	25	9,500	20	7,600	30	11,400	70	26,600
V. F. Repeater, Toll	140	-	-	11	1,540	-	-	-	-	-	-
V. F. Repeater, EAS	140	-	-	22	3,080	5x	700	7	980	3	420
V. F. Repeater, Subscriber	70	-	-	-	-	-	-	5	350	-	-
CMO Treatment (Lines)	-	130	5,600	60	3,700	50	3,300	-	-	20	2,800
Loop Extenders	60	-	-	-	-	-	-	9	540	-	-
ANI	-	-	6,800	-	4,800	-	4,600	-	4,200	-	4,600
Trunk and Subscriber Loop	700	-	-#	-	-	-	-#	1	700	1	700
Transmission Test Equipment											
Remote Subscriber	3,300	1	6,700	1	3,300	1	3,300	1	3,300	1	3,300
Line Test Equipment											
Standby Generator	-	1-25 KW	2,600	1-10 KW	2,150	1-5 KW	1,950	-	-	1-15 KW	2,350
Exchange Total			\$166,700		\$72,470		\$69,000		\$25,370		\$67,670

Existing Plant Data for Other Exchanges	Lines-Terminals	Manufacturer	Date of Manufacturer	TPS or TPL	Resistance Limit
Plymouth	600-600	RST Co.	1965	TPS	1500 ohms
Geneva	450-500	RST Co.	1965	TPS	1500 ohms
Violet	500-500	RST Co.	1971	TPS	1900 ohms

* Addition to Existing Board
 ** Transfer and Installation of 170 Lines from Violet
 *** Transfer and Installation from Lafayette

Transmission Test Equipment Included in Per Line Cost
 ## Includes Funds for Master Unit

EXHIBIT F - STATION EQUIPMENT

	UNIT COST	WESTOVER		FLAGSTAFF		UGANDA		REDSTONE		LAFAYETTE		PLYMOUTH		GENEVA		VIOLET	
		UNITS	COST	UNITS	COST	UNITS	COST	UNITS	COST	UNITS	COST	UNITS	COST	UNITS	COST	UNITS	COST
Main Station Installations (Excluding PABX, PBX, and Key System)	\$ 90	76	\$ 6,840	50	\$ 4,500	203	\$18,270	58	\$ 5,220	121	\$10,890	80	\$ 7,200	60	\$ 5,400	40	\$ 3,600
Main Station Installations Not Requiring Telephone Set (Net Idle Services)	65	49	3,185	12	780	7	455	11	715	29	1,885	20	1,300	16	1,040	18	1,170
Extensions to Main Stations, PABX and PBX	40	74	2,960	28	1,120	32	1,280	41	1,640	116	4,640	16	640	12	480	8	320
Paystations, Outside Full Length	780	1	780	-	-												
Paystations, Inside Shelf Type	450	1	450	-	-												
PBX Trunk	-	1	200	-	-					1	200						
Key Systems - 2 Line (Including Extensions)	190	55	10,450	15	2,850	10	1,900	15	2,850	35	6,650	25	4,750	20	3,800	20	3,800
Key System (10-Lines Wired)		1	1,100														
202 Data Set		1	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Facsimile Set (4.5 Minutes)		1	2,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EXCHANGE TOTAL			\$29,565		\$ 9,250		\$21,905		\$10,425		\$24,265		\$13,890		\$10,720		\$ 8,890
SYSTEM TOTAL									\$128,910								

EXHIBIT G - DETAIL OUTSIDE PLANT COST

1. WESTOVER TOWN (Modifications)

<u>PLANT</u>	<u>UNITS (KF)</u>	<u>UNIT COST</u>	<u>COST</u>
U300-24*	1.0	\$ 1,800	\$ 1,800
C300-24	1.5	1,500	2,250
C150-24	1.3	850	1,105
C100-24	1.4	630	882
C75-24	.9	520	468
C50-24	1.9	420	798
C25-24	1.1	300	330
C12-24	1.8	230	414
BJ300-24	.9	1,360	1,224
BJ200-24	5.0	970	4,850
BJ150-24	6.0	770	4,620
BJ100-24	.2	570	114
BJ50-24	1.4	370	518
BJ18-24	1.7	230	391
BW3-24	.5	150	75
BW6-24	2.1	250	525
Sub-Total	28.7 KF (5.4 MI)		\$20,364

2. WESTOVER RURAL (Modifications)

<u>PLANT</u>	<u>UNITS (MILES)</u>	<u>UNIT COST</u>	<u>COST</u>
BJ200-24	1.0	\$ 5,090	\$ 5,090
BJ75-24	7.5	2,480	18,600
BJ50-24	9.1	1,960	17,836
BJ25-24	7.1	1,430	10,153
BJ18-24	7.2	1,240	8,928
BJ12-24	16.3	1,100	17,930
BW6-24	29.7	860	25,542
BW3-24	3.5	790	2,765
BW2-24	3.8	690	2,622
Sub-Total	85.2 MI		\$109,466

3. WESTOVER RURAL (New)

<u>PLANT</u>	<u>UNITS (MILES)</u>	<u>UNIT COST</u>	<u>COST</u>
BJ50-24	3.8	\$ 1,960	\$ 7,448
BW6-24	3.9	860	3,354
BW3-24	1.3	790	1,027
BW2-24	8.1	690	5,589
Sub-Total	17.1		\$ 17,418
Exchange Total			\$147,248

REA TE & CM 205

COMPLETED DETAILED OUTSIDE PLANT COST ESTIMATES
OF 5-YEAR SYSTEM WOULD BE INCLUDED FOR THE
FOLLOWING REMAINING EXCHANGES

FLAGSTAFF

UGANDA

REDSTONE

LAFAYETTE

G-2 thru 5

EXHIBIT H - URBAN-RURAL BREAKDOWN

ANALYSIS OF CONSTRUCTION COSTS IN WESTOVER

The following is an analysis of construction costs for facilities in and related to the nonrural town of Westover:

COE additions (less trunks)	\$ 92,100
Outside Plant within corporate limits of Westover	
a. To serve urban subscribers	6,460
b. To serve rural subscribers	13,900
Station installations in Westover:	11,980
Toll trunking facilities:	
a. Within corporate limits (COE trunks, carrier)	10,520
b. Outside corporate limits (carrier repeaters and housings)	2,780
EAS trunking facilities to Muroc (Town of more than 1,500)	
a. Within corporate limits (COE trunks and carrier)	3,080
b. Outside corporate limits (carrier repeaters and housings)	620
EAS trunking facilities to Lafayette (Town of less than 1,500)	
a. Within corporate limits (COE trunks)	700
b. Outside corporate limits but within Central Office Area	0
c. Within Lafayette Central Office Area (2 COE trunks)	700

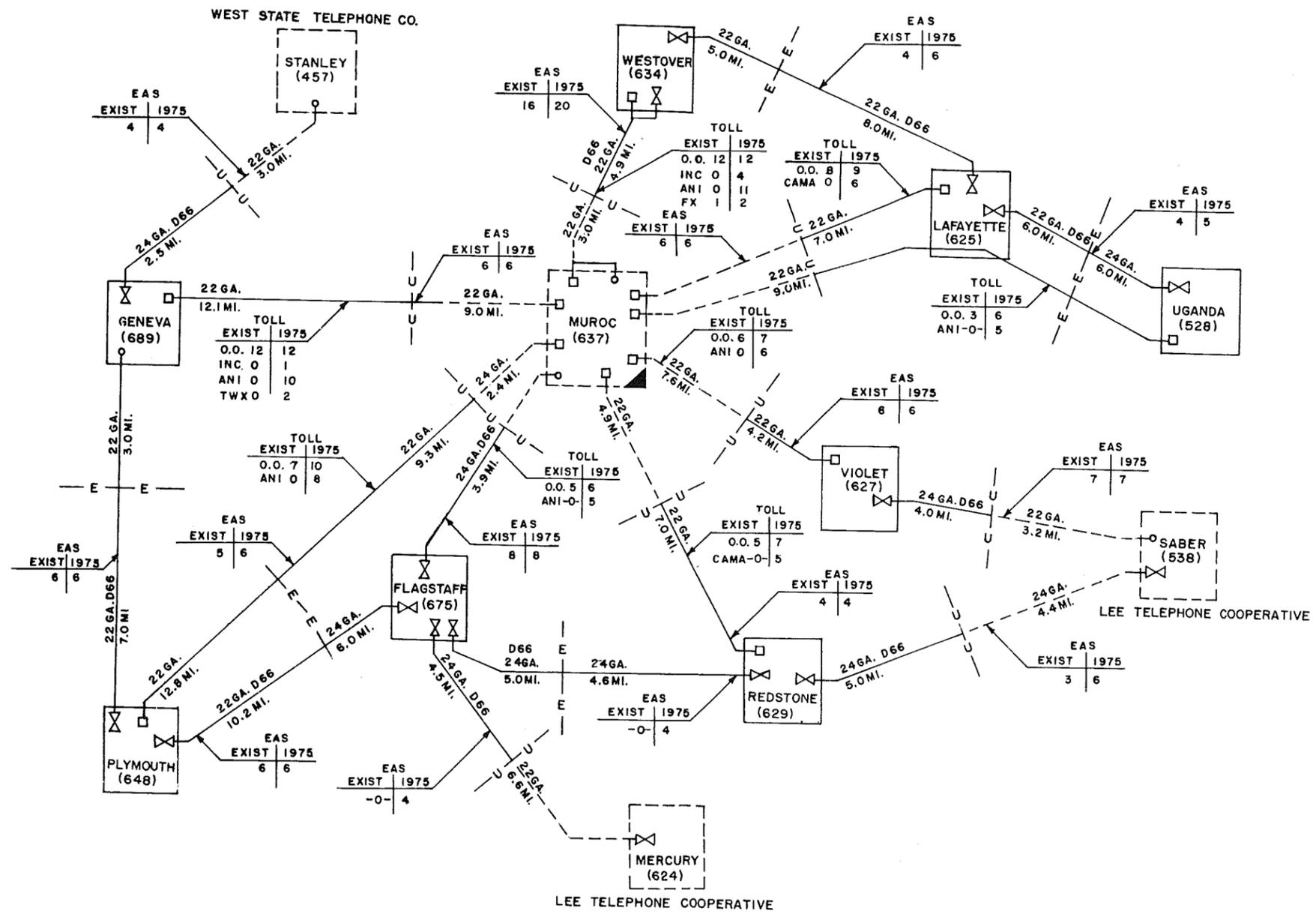
(Used existing cables for physical circuits)

EXHIBIT I - FUTURE UPGRADING TO ONE-PARTY
(Incremental Cost Over Exhibit D Cost)

	<u>REDSTONE</u>		<u>LAFAYETTE</u>		<u>SYSTEM</u>
	<u>UNITS</u>	<u>COST</u>	<u>UNITS</u>	<u>COST</u>	
CENTRAL OFFICE EQUIPMENT					
Additions (Lines, Terminals, Trks.)	20-20-6	\$ 9,500	80-0*-10	\$ 17,500	
ANI (Lines)	200	1,000	500	2,500	
CMO (Lines)	-	-	80*	2,000	
L.E.'s and V.F.R.'s	10	1,500	-	-	
Total					\$ 34,000
ELECTRONIC EQUIPMENT					
Toll Carrier	3	200**	6	4,700	
EAS Carrier	-	-	4	3,100	
Station Carrier	10	3,800	20	7,600	
Trunk V.F. Repeaters	3	400	-	-	
Total					19,800
OUTSIDE PLANT, BURIED		84,000		152,000	236,000
STATION EQUIPMENT	-	-	-	-	
LAND AND BUILDINGS	-	-	-	-	
MISCELLANEOUS					
(a) Engineering		11,500		23,000	34,500
REMOVALS		7,500		10,500	18,000
TOTAL COST		119,400		222,900	342,300
ROUTE MILES OF PLANT (Including Drops)					
(a) Retained as Is	-		-		
(b) Modifications	59.0		117.2		
(c) New	11.3		9.6		
(d) Retired	-		0.0		
(e) Total Mileage	<u>70.3</u>		<u>126.8</u>		
PLANT RETIRED					
(a) Original Cost		59,000		117,000	176,000
(b) Salvage		2,000		3,000	5,000

*Completing CMO Group

**Transferred from Lafayette



5 YEAR

TOLL (P=.01)	UNIT CALLS	
	O.O.	CAMA
GENEVA - MUROC	205	140
PLYMOUTH - MUROC	145	90
FLAGSTAFF - MUROC	57	40
REDSTONE - MUROC	80	43
VIOLET - MUROC	100	60
UGANDA - MUROC	59	39
LAFAYETTE - MUROC	155	98
WESTOVER - MUROC	258	162

EAS (P=.03)

GENEVA - STANLEY	35
GENEVA - PLYMOUTH	76
GENEVA - MUROC	65
PLYMOUTH - MUROC	75
PLYMOUTH - FLAGSTAFF	78
FLAGSTAFF - MERCURY	37
FLAGSTAFF - MUROC	140
REDSTONE - MUROC	72
REDSTONE - SABER	63
VIOLET - SABER	89
VIOLET - MUROC	77
UGANDA - LAFAYETTE	50
LAFAYETTE - WESTOVER	76
LAFAYETTE - MUROC	120
WESTOVER - MUROC	390
FLAGSTAFF - REDSTONE	35

- LEGEND**
- FACILITIES OWNED BY FLAGSTAFF TEL. CO.
 - - - - - FACILITIES OWNED BY CONNECTING CO.
 - X— VOICE FREQUENCY REPEATER
 - CARRIER DERIVED TRUNK

NOTE: ALL TRUNKS GROUPS WILL BE OPERATED AT A NET CIRCUIT LOSS OF 3.0 db.

FLAGSTAFF TELEPHONE COMPANY	
WISCONSIN 699-A	
TRUNKING DIAGRAM 3-30-71	NOT TO SCALE

ENGINEER'S WORK SHEETS

Westover "Long Loops"

79 Lines in 1300-1700 ohm category
47 Lines in 1700-3000 ohm category

Alternatives (1300-1700 ohm loops)

A. Convert CO Resistance Limit of 700 existing lines from 1500-1900 ohms:

700 Lines @ \$6 per line = \$4,200

B. Individual Treatment

79 Loops Extenders @ \$60 = \$4,740

C. CMO Treatment

80 Lines @ \$15	\$1,200
1 Booster Battery @ \$300	300
8 Long Line Adaptors @ \$100	800
	<u>\$2,300</u>

Use CMO @ \$2,300

Alternatives (1700-3000 ohm loops)

D. Individual Treatment

47 Loop Extenders @ \$60	\$2,820
47 Voice Frequency @ \$80	3,750
	<u>\$6,570</u>

E. CMO Treatment

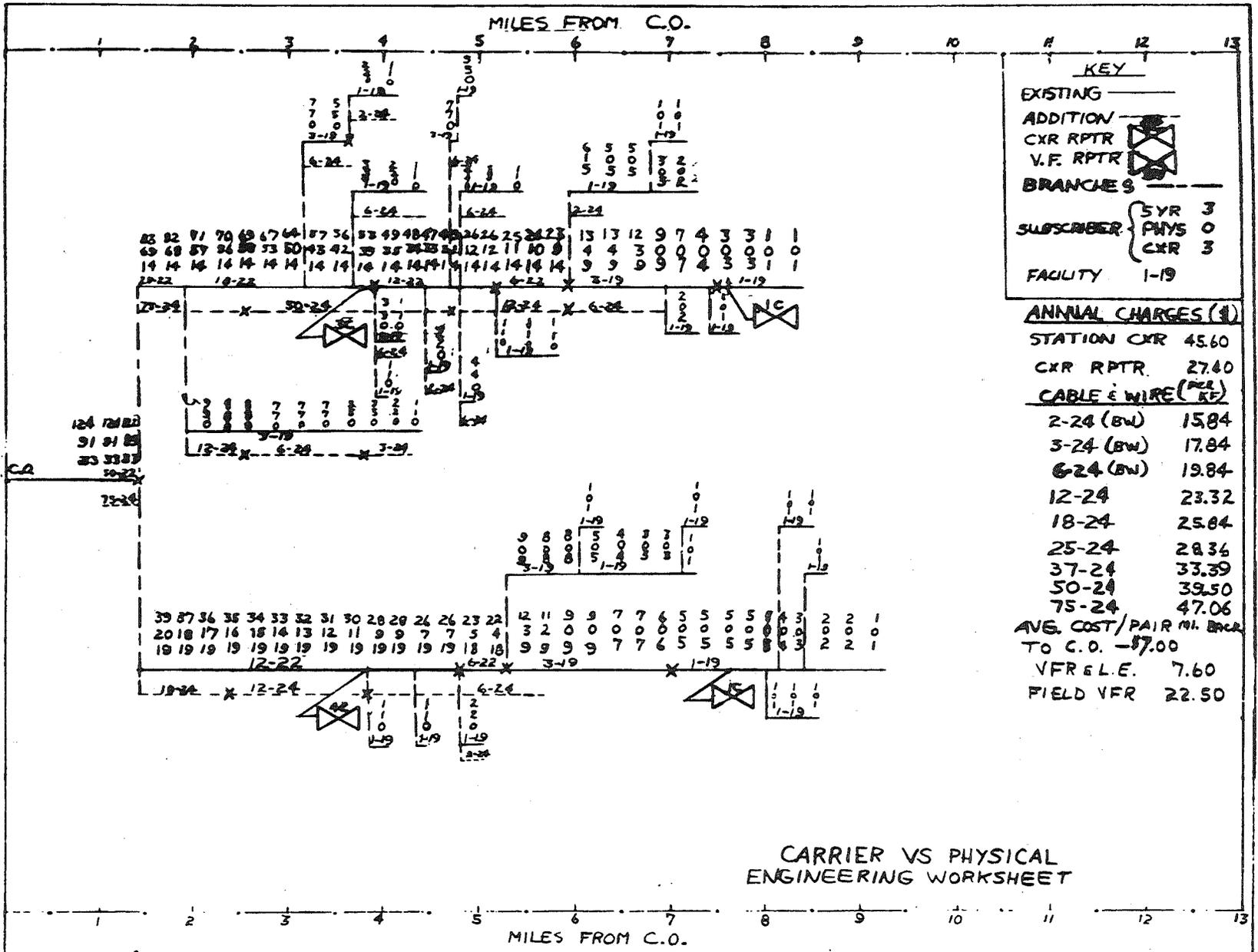
1 Booster Battery Primary @ \$300	\$ 300
1 Booster Battery Standby @ \$300	300
1 Booster Transfer Circuit @ \$400	400
50 Lines in CMO Operation @ \$15	750
6 Long Line Adaptors @ \$100	600
6 Voice Frequency Repeaters (Sel.) @ \$80	480
6 Voice Frequency Repeaters (Conn.) @ \$80	480
	<u>\$3,310</u>

Use CMO @ \$3,300

No additional linefinder or connector shelves are required.

Total Cost of Loop Extension Treatment

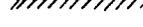
\$2,300 + 3,300 = \$5,600
(C) (E)



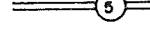
FORM 100 & CN 205

TELEPHONE MAP SYMBOLS

BOUNDARIES

	STATE LINE AND INTERNATIONAL BOUNDARY
	COUNTY BOUNDARY
	TOWNSHIP LINE
	SECTION LINE
	LATITUDE AND LONGITUDE LINE
	RESERVATIONS, NATIONAL AND STATE FORESTS AND PARKS
	SYSTEM BOUNDARY
	EXCHANGE AREA BOUNDARY
	CORPORATE LIMITS

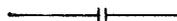
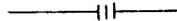
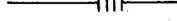
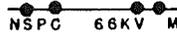
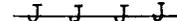
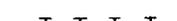
CULTURAL FEATURES

	NATIONAL INTERSTATE HIGHWAY
	U.S. HIGHWAY (OTHER)
	STATE ROAD
	COUNTY ROAD
	UNIMPROVED ROAD
	RAILROAD
	RAILROAD AND COMMUNICATION LINE

AREA COVERAGE SURVEY SYMBOLS

	PS-1030 EXISTING SUBSCRIBER		PAYSTATION 1030 OHMS		INHABITED ESTABLISHMENT
	S EXISTING SEASONAL SUBSCRIBER PROPOSED GRADE OF SERVICE LOWEST RESIDENCE SERVICE OFFERED		ASSIGNED NUMBER FOR EACH ESTABLISHMENT		VACANT ESTABLISHMENT CAPABLE OF BEING INHABITED
	B1-2K HELD ORDER - PROPOSED 1 PARTY BUSINESS WITH 2 LINE KEYSYSTEM				VACANT ESTABLISHMENT NOT A PROSPECT FOR SERVICE PABX-3 FUTURE 3 TRUNK PABX

TELEPHONE AND ELECTRIC OUTSIDE PLANT SYMBOLS

	ELECTRIC DISTRIBUTION LINE--SHOW OWNERSHIP, VOLTAGE, NUMBER OF PHASES AND METHOD OF OPERATION IF NOT INCLUDED BY NOTE ON MAP.
	1 PHASE - 2 WIRE
	2 PHASE - 3 WIRE
	3 PHASE - 4 WIRE
	REA ELECTRIC DISTRIBUTION STANDARD
	TRANSMISSION LINE (SHOW OWNERSHIP, VOLTAGE, AND METHOD OF OPERATION IF NOT INCLUDED BY NOTE ON MAP.)
	JOINT USE WITH ELECTRIC DISTRIBUTION LINE
	JOINT USE WITH ANOTHER TELEPHONE COMPANY LINE
	REA-BORROWERS TELEPHONE LINE
	OTHER TELEPHONE LINES (SHOW OWNERSHIP)
	63 SUBSCRIBERS SERVED BY PHYSICALS
	28 SUBSCRIBERS SERVED BY CARRIER
	FIELD MOUNTED REPEATERS (8 CARRIER - 2 VOICE FREQUENCY)

EXAMPLES OF THE USE OF SYMBOLS

- 
BWS00-24X50-22P Dual buried cables, 300 pair-24 gauge and 50 pair-22 gauge to be retained (no suffix). No reinforcement.
- 
10P0-0800X30KN
BJ00-24N Ten pin crossarm, eight .080 inch, 30 percent copper covered steel line wire to be removed, nonreusable material, (xx). 50 pair-24 gauge buried cable to be installed (N) in same right of way.
- 
25-22P XZ
BJ00-24N 25 pair-22 gauge plastic insulated, plastic jacketed aerial cable to be retired - reusable (xz). 200 pair-24 gauge buried cable to be installed (N) in same right of way.
- 
704 1-606-24Z
1-1515-24Z N Underground conduit and cable - 4 multitrack duct, duct #1 presently occupied with 1-606 pair-24 gauge paper insulated, plastic jacketed cable. 1-1515 pair-24 gauge paper insulated, plastic jacketed cable to be installed (N) in duct #2.
- 
BWS-24N ✓ 2350 2 pair-24 gauge buried wire to be installed on new right of way. Subscriber is 2350 ohms from central office and served by carrier (✓).

Additional Symbols Required on Prestaking Maps



First load coil from central office
 D66 loading
 25 load coils



Existing B1 subscriber to be served by carrier system number 3, channel number 4, at establishment 1.

NOTES

1. For plant item designations use nomenclature found in REA Form 511, "Telephone Construction Contract," to maximum practical extent.
2. For consistency existing plant is shown above the line, with or without a suffix, as required. Proposed construction is shown below the line with the suffix N.
3. All dimensions are approximate and may be modified in individual situations so long as clarity is maintained.
4. Any symbols on maps which are different from those on this form shall be explained in a legend on the map itself.
5. Existing and potential subscribers anticipated within 5 years will be designated by a solid line from the telephone line from which they are served to the subscriber symbol. Establishment symbols not shown connecting to a telephone line are not counted in determining feeder cable size.
6. Refer to PEA Telephone Engineering and Construction Manual Section 205 for other mapping instructions.
7. On prestaking maps submitted to REA for approval, party line establishments to be served by the same circuit should be grouped and encircled.