

APPLICATION GUIDE FOR DIGITAL LIGHTWAVE  
TRANSMISSION SYSTEM SPECIFICATIONS  
REA FORM 397h

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1. GENERAL

1.1 This section provides REA borrowers, consulting engineers, optical cable and lightwave terminal equipment manufacturers and sellers with information concerning the use of REA Form 397h, REA Design Specifications for Digital Lightwave Transmission Systems.

1.2 Form 397h is arranged to accommodate terminal equipment purchases for either completely new systems or for additions to existing systems. Since other procedures and contract forms are already available for the purpose, Form 397h is not intended for the purchase of optical cable.

1.3 To provide some flexibility in procurement and still ensure that the composite system constructed will be completely responsive and compliant with the requirements, all potential suppliers must be familiar with the overall project. Form 397h with addenda serves this purpose.

1.4 Much of the information supplied by Form 397h can be completed by itemizing quantities in blanks provided or by checking off appropriate blocks in the form. In general, every line item of Form 397h should be filled in. When information requested is not directly applicable, the entry N/A for "not applicable" should be made. When the requested information has not been established, the entry N/K for "not known" should be made.

1.5 Various examples are given in this TE&CM section to clarify entering requested data.

1.6 REA TE&CM 971 should be referred to for definitions of lightwave terms.

1.7 Provision is made in Form 397h for Specification Addenda to be included by both the Purchaser and the Seller in appropriate sections. In preparing Form 397h, both the Purchaser and the Seller should carefully review their presentations in these addenda for clarity and completeness.

1.8 Form 397h and all addenda became a part of the contract specifications.

## 2. PLANNING LIGHTWAVE SYSTEM PURCHASES

2.1 There may be a number of technically satisfactory alternative configurations possible in most lightwave transmission systems. All reasonable alternatives should be considered.

2.2 Although the primary objectives are technical adequacy, long term maintainability, transmission capacity, and initial cost, less obvious factors such as flexibility of use of the constructed facilities should also be a consideration.

2.3 Any lightwave transmission facility represents a substantial transmission capacity along the entire length of the optical fibers. This additional capacity may find subsequent use for new service points, either along this length or beyond the initial termination point.

2.4 When possible, and if no significant cost escalation is involved, system designs should provide such flexibility of use even if the additional service points may not be definable at the time of initial construction.

## 3. FORM 397h, PART I

3.1 Item 1.2 identifies the company and the REA Project Number for which the lightwave system is required. In addition, this item provides an entry blank to clearly identify the major system components to be provided by the contract. An X or check mark should be placed in the appropriate space(s). Note that an entry might be appropriate in only one space, or in both spaces.

3.1.1 Item 1.3 identifies the type of contract. An entry should be made in either the block for REA Contract Form 397 (furnish and install) or REA Contract Form 398 (furnish only). There are no conditions under which both blocks would be checked. If a procurement involves furnish only for one item of equipment and furnish and install for a different item, a separate Form 397h should be filled out to cover the two different procurements.

3.1.2 Item 1.4.1 A Purchaser's narrative should always be included. Such a narrative may be quite brief for less complex contracts but a good narrative will always help simplify a contract.

3.1.3 Item 1.4.2 The Purchaser's Specifications always include REA Form 397h and any attached addenda and may also include other specifications by reference. All items of equipment specified in Part III of REA Form 397h and attached addenda are to be included in the Seller's basic proposal unless specifically stated otherwise. Where a complete system is divided into separate contracts for component elements, each such separate contract must be identified in a separate REA Form 397h with appropriate addenda attached.

3.1.4 Item 1.4.3 The Seller's Proposal, Part IV of REA Form 397h and attached addenda should contain all the information which might be considered to be useful or essential in evaluating the proposal. Unless

specifically noted otherwise by the Seller in Part IV of REA Form 397h (3. Seller's Exceptions to Specifications), the Seller's equipment and proposal shall be assumed to meet all of the Purchaser's Specifications. A Form 397h is incomplete without a Part IV completed by the Seller.

3.1.5 Item 1.4.4 defines the Seller's responsibilities under a Form 397h procurement.

3.1.6 Item 1.4.5 A Seller's Narrative should always be included. Such a narrative may be quite brief for less complex contracts but a good narrative will always help simplify a contract.

3.2 Item 2.4 If any additional documentation other than that described in Item 2.4 is required, an entry in the space provided is required. If no additional documentation is required, enter "None Required".

3.2.1 Item 2.6 An entry is required denoting the number of employees to be trained. If no training is required, enter "None Required".

3.2.2 Item 2.7 Any unusual restrictions on work hours should be entered in the space provided. If there are no restrictions, enter "No Restrictions".

3.3 Item 3.1 If the complexity of the project requires it, separate Part III presentations (with or without separate addenda) may be included. If so, a brief notation and identification of each Part III should be entered in the space provided. If only one Part III is presented, enter N/A for "Not Applicable".

3.3.1 Item 3.4.3 An entry is required in one of the spaces provided.

3.3.2 Item 3.4.4 An entry is required in one of the spaces required. The category "to be supplied by others" is intended to cover situations where housings are installed under a separate contract. If an entry is made under this last category, a brief clarifying reference should be included in Part III of REA Form 397h.

3.3.3 Item 3.4.5 An entry is required in one of the spaces provided.

#### 4. FORM 397h, PART II

4.1 Items 1, 2, 3, and 4 All items in Part II are self-explanatory.

#### 5. FORM 397h, PART III

5.1 Item 1.1 identifies the company and the REA Project Number for which the lightwave system is required.

5.1.1 Item 1.2 Every line item in Part III of Form 397h is preceded by an empty space. An entry is required in this space whenever no specific information entry has been made in the various blocks listed in that line item. The space preceding the line item should be marked N/A if the item in

its entirety is not applicable, or N/K if the information requested is not known.

Example 1: Item 2.2.3 is given as \_\_\_\_\_ 2.2.3 Optical Data Rate (Mb/s). If the contract were for a system where the Optical Data Rate is known to be 45 Mb/s, an entry of 45 should be made under the appropriate link column. If the Optical Data Rate has not been determined, N/K (not known) should be placed in the space preceding the item, i.e., N/K 2.2.3 Optical Data Rate (Mb/s)

Example 2: Item 2.5.2 is given as \_\_\_\_\_ 2.5.2 Number of Jackfield Access. If the contract were for additional plug-in equipment units to expand an existing system, where the Jackfield was already in place and wired, or if the contract were for optical terminal equipment only, N/A (not applicable) should be placed in the space preceding the line item number, i.e., N/A 2.5.2 Number of Jackfield Accesses.

5.2 Item 2.1 identifies by number from one to four individual links, and by name or other designation, each individual terminal end of each link. The nomenclature used here should agree with any other references in trunking diagrams, narratives, etc. If only one link is involved, enter N/A in Links 2, 3, and 4. If two links are involved, enter N/A in Links 3 and 4, etc.

5.2.1 Item 2.2.1 Enter total cable route lengths in the appropriate spaces. If the contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number.

5.2.2 Item 2.2.2 Indicate fiber type by an X or check mark in the appropriate spaces. If this contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number.

5.2.3 Item 2.2.3 Enter the optical data rate if known or enter N/K if not known. (See paragraph 5.1.1, Example 1.)

5.2.4 Item 2.2.4 Enter the operating wavelength for each link if it is known. For example, if the operating wavelength for Link 1 is 1310 nm, enter 1310 nm in the first column. If the operating wavelength has not been determined, enter N/K (not known) in the appropriate space or spaces. If this contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number.

5.2.5 Item 2.2.5 Enter the figure for fiber loss as dB/km at the operating wavelength. If the fiber loss has not been determined, enter N/K in the appropriate space or spaces. If this contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number.

5.2.6 Item 2.2.6 Indicate the type of splicing for each link by an X or check mark in the appropriate spaces. If this contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number. Note: The response required applies to interconnecting cable splices only and is not intended to cover any

incidental optical fiber connectors which might be employed at terminal locations.

5.2.7 Item 2.2.7 Enter the number (estimated if necessary) of fiber splices that will be required in any one fiber in any one link. This information is intended as applications engineering data, therefore, the splice count should be for any single fiber in each link, not for the total number of splices multiplied by the total number of fibers. If system engineering has not established (or estimated) the number of splices required, enter N/K for not known in the appropriate link spaces. If this contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number.

5.2.8 Item 2.2.8 Indicate the number of optical fibers assigned for primary service and protection switching service by entering a number in the appropriate spaces. For example, if, in a 4 fiber cable, 2 fibers are for primary service and 2 fibers are utilized as a protection switched redundant facility, the number 2 would be entered on both the first and second lines for the appropriate link. If no protection switching is provided but two independent transmission systems, each using 2 fibers, are configured in parallel with traffic divided between them, the number 4 should be entered on the first line indicating 4 fibers are assigned to primary service. Unassigned (dark) fibers are all fibers not equipped with terminal equipment. If this contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number.

5.3 Item 2.3.1 Enter the number of new intermediate repeater equipment involved. This entry is for new repeater equipment, not individual repeater locations. If this contract is for digital terminal equipment additions to an existing installation only, enter N/A in the space preceding the line item number because no new repeater equipment would be required.

5.3.1 Item 2.3.2 Enter the number of new intermediate repeater locations involved. This entry is for new repeater locations required, not for individual repeater equipment. If this contract is for digital terminal equipment additions to an existing installation only, enter N/A in the space preceding the line item number because no new repeater locations would be required.

5.3.2 Item 2.3.3 Indicate the number and type of repeater housings required in the appropriate space or spaces. If this contract is for equipment additions to an existing installation, enter N/A in the space preceding the line item number.

5.4 Item 2.4.1 Indicate the type of light source required by entering an X or check mark. If this contract is for digital multiplex equipment additions to an existing installation, enter N/A in the space preceding the line item number. If the type of light source to be supplied has not been decided upon, enter N/K (not known) in the space preceding the line item number.

5.4.1 Item 2.4.2 Indicate the type of detector required by entering an X or check mark. If this contract is for digital multiplex equipment

additions to an existing installation, enter N/A in the space preceding the line item number. If the type of detector to be supplied has not been decided upon, enter N/K (not known) in the space preceding the line item number.

5.5 Item 2.5.1 Indicate in the spaces provided the number of working digital interfaces to be provided by this contract for each terminal location. Note: It is possible that one terminal end of a link may provide digital interfaces that are not the same as the other terminal end of the link. For example, this might be the case at a drop and insert intermediate location where some digital signals pass through the terminal at a higher digital rate and others terminate at a lower rate at that same point. It is also possible that two different entries may be necessary for a single terminal. For example, one interface may be at DSX3 for through service at an intermediate location and a second entry may be for several DSX1 interfaces for terminal service at that same location. If this contract is for lightwave terminal equipment only, enter N/A in the space preceding the line item number. If this contract is for digital equipment additions to an existing installation, enter the number of new digital interfaces to be provided in this contract not the total number that will be available after this particular addition is completed.

5.5.1 Item 2.5.2 Indicate in the spaces provided the number of jackfield accesses to be provided by this contract for each terminal location and for each data rate. Note: It is possible that one terminal end of a link may require different access at different digital interface rates than the other end of that same link. The entry required is for the number of new jackfield access points to be provided at each terminal end for each different digital rate. If this contract is for lightwave terminal equipment only, enter N/A in the space preceding the line item number. If this contract is for digital equipment additions to an existing installation, enter the number of new jackfield access points to be provided in this contract not the total number that will be available after this particular addition is completed.

5.6 Items 3.1 through 3.20 All item are self-explanatory.

6. FORM 397h, PART IV

6.1 All items in Part IV of Form 397h are self-explanatory.