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TRACKING AND DATA RELAY SATELLITE SYSTEM

GOVERNMENT

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HEARING
BEFORE THE
SUBCOMMITTEE ON
SPACE SCIENCE AND APPLICATIONS
OF THE
COMMITTEE ON
SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
NINETY-FOURTH CONGRESS
SECOND SESSION

SEPTEMBER 21, 1976

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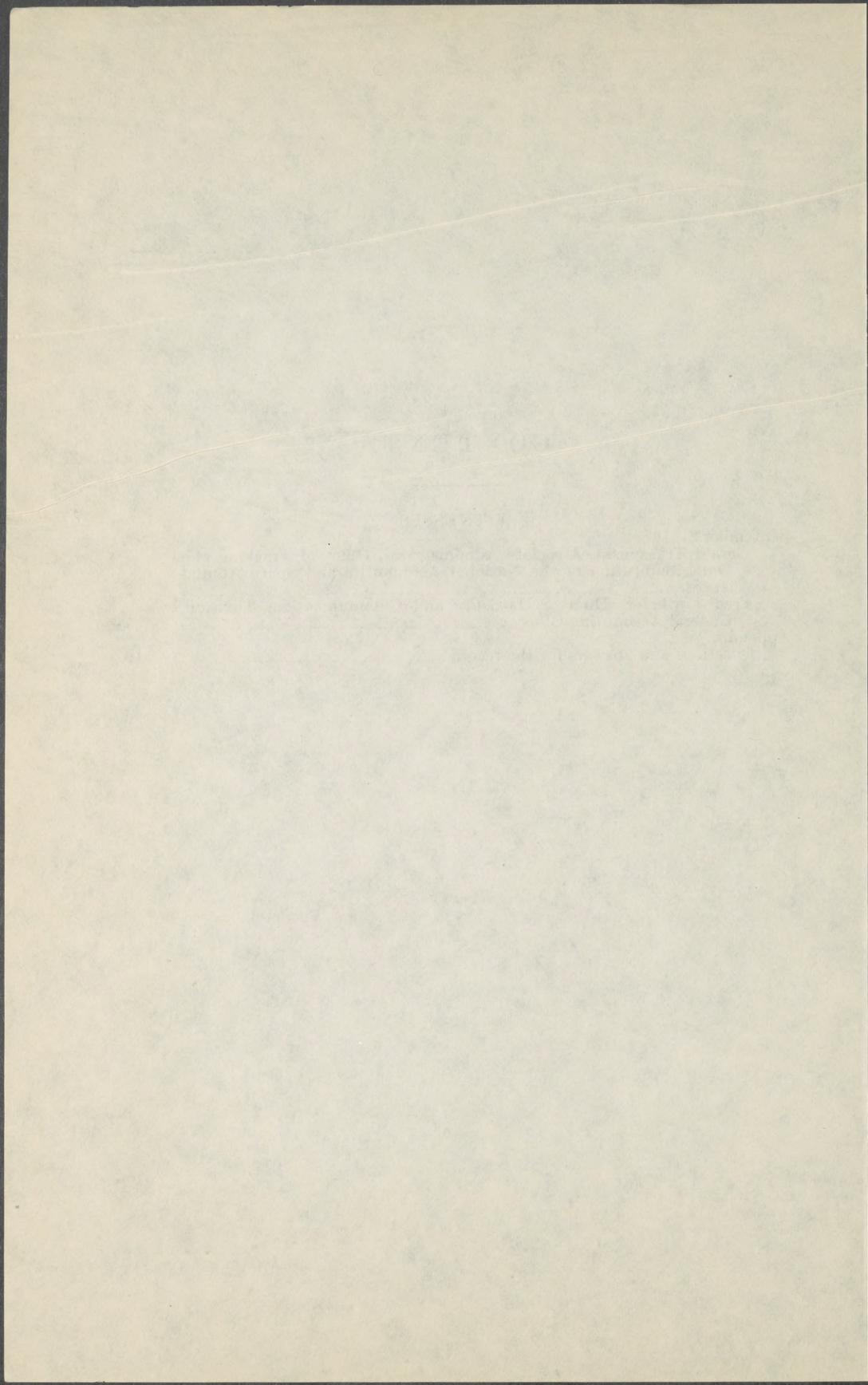
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TRACKING AND DATA RELAY SATELLITE SYSTEM

TUESDAY, SEPTEMBER 21, 1976

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS,
Washington, D.C.

The subcommittee met, pursuant to notice, at 3 p.m., in room 2325, Rayburn House Office Building, Hon. Don Fuqua, chairman, presiding. Mr. FUQUA. The subcommittee will be in order.

Today the subcommittee meets for the purpose of reviewing NASA's proposed method of contracting the Tracking and Data Relay Satellite System.

As you are aware, NASA has proposed to enter into a leased services arrangement with a common carrier company for a 10-year period at a fixed amount per year in lieu of procuring the system under the traditional purchase techniques employed in the past.

The subcommittee has raised the question in prior hearings as to the cost of acquiring the TDRSS capability as a Government-owned system compared to that of a leased service.

In concert with this concern, the subcommittee has provided NASA with enabling legislation in the last two-fiscal-year authorizations which allowed NASA to perform the lease-versus-purchase analysis using contractor data obtained from proposals.

In response to the desires of the subcommittee, NASA will present at this time, background information on the system, plus the results of the lease-versus-purchase cost comparison.

Each member has before him a copy of the GAO report dated July 15, 1976, which deals with the methodology used by NASA in their lease/purchase analysis, plus a copy of questions and NASA's answers supplied to the subcommittee yesterday.

Once again, I reiterate that the subcommittee's interest in this hearing is to review the method of contracting only and there is no intent or desire to participate or influence the selection of a contractor.

The only issue to which the subcommittee will address itself is "whether it is in the best interest of the Government to allow NASA to proceed with a lease approach."

The GAO has been asked to this hearing and is prepared to provide the subcommittee with comments on the applications of the methodology used by NASA in their analysis.

I would also like to note the full cooperation between GAO and NASA in reviewing the data during the final stages of the evaluation which, it is my understanding, has allowed GAO to apply current numbers to the lease-versus-purchase methodology used by NASA.

This will allow GAO to comment on the lease-versus-purchase methodology as applied.

The first witness for NASA will be Mr. Gerald Truszynski, the Associate Administrator for the Office of Tracking and Data Acquisition.

We would appreciate your introducing your associates who are with you.

I believe that Mr. Allen, the Assistant Administrator for Legislative Affairs, will have a press release that will be available now.

Please proceed.

STATEMENT OF GERALD TRUSZYNSKI, ASSOCIATE ADMINISTRATOR, OFFICE OF TRACKING AND DATA ACQUISITION OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. TRUSZYNSKI. Thank you, Mr. Chairman.

It is a pleasure to appear before your subcommittee today to report on the status of our plans for acquiring tracking and data relay satellite system, or TDRSS, services for the support of the NASA flight programs of the 1980's.

Accompanying me today are NASA's General Counsel, Mr. S. Neil Hosenball, and the Assistant Administrator for Procurement, Adm. Stuart J. Evans.

As you know, we are now in the final stages of the procurement process leading to the award of a contract for TDRSS services for a 10-year period beginning in 1980.

In accordance with our plans, the contractor would design and construct the system during the implementation phase and provide maintenance and operations during the 10-year service period, during which period NASA would pay for the services at a fixed rate to be specified in the TDRSS contract.

Two contractors, RCA Global Communications and Western Union Telegraph Co., are competing for the contract.

Yesterday the TDRSS Source Evaluation Board presented its detailed evaluations of the competing proposals to Dr. Fletcher and top management officials and this afternoon NASA is announcing that both proposers were selected for final competitive negotiations leading to the award of a single contract to one of the two firms.

In effect, what Dr. Fletcher decided based upon yesterday's presentation was that each proposal provides the basis for a TDRSS contract acceptable to NASA assuming, as we do, that disadvantages and weaknesses identified by the Source Evaluation Board in each proposal can be eliminated during the competitive negotiations.

If our negotiations are successful, two signed contracts including provisions binding on the respective contractors will be presented to the Administrator for a decision by him as to which one will be selected by NASA as being most advantageous to the Government.

As the subcommittee knows, initiation of such multiple negotiations is not unusual in complex procurements.

Our plan is to complete these negotiations by the end of this year. If we can maintain that schedule, TDRSS services would be available in early 1980 in time to support the Shuttle operational flights.

We have provided to the subcommittee copies of the NASA press release announcing our decision and you may wish to include that release in the record of these hearings.

Mr. FUQUA. We will make that part of the record.

[The press release follows:]

[From NASA News]

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
Washington, D.C., September 21, 1976.

Ken Atchison
John Kley
Goddard Space Flight Center, Greenbelt, Md.
Release No. 76-158

NASA CONTINUES TDRSS COMPETITION BETWEEN TWO CONTRACTORS

NASA has selected Western Union Telegraph Co., Upper Saddle River, N.J., and RCA Global Communications, Inc., New York, N.Y., for competitive negotiations leading to award of a single contract to provide Tracking and Data Relay Satellite System (TDRSS) services for support of Earth orbital spacecraft for a 10-year service period beginning in 1980.

TDRSS will consist of two specialized relay satellites in synchronous Earth orbit and ground terminal facilities located at White Sands, N.M. These satellites will relay data, commands and voice to and from spacecraft and the ground terminal.

This system will support spacecraft in Earth orbit up to at least 5,000 kilometers (3,100 miles) altitude. For this group of satellites, the system can provide coverage for 85 to 100 per cent of each orbit as compared to an average of 15 per cent for today's world-wide ground-based system.

The TDRSS spacecraft and ground station facilities will support all NASA Earth-orbital scientific, applications and manned spacecraft missions including the Space Shuttle, Spacelab and the automated spacecraft to be inserted in orbit by the Shuttle in the 1980s.

When fully operational, TDRSS will permit closing many of the government-owned ground stations and associated leased communication circuits now required for support of Earth-orbital satellites in the NASA Spaceflight Tracking and Data Network.

Portions of the ground-based system will be retained only for synchronous and higher elliptical altitude spacecraft orbits.

Goddard Space Flight Center, Greenbelt, Md., is responsible for management of this procurement.

Mr. TRUSZYNSKI. Mr. Chairman, in the materials we plan to present today and in the responses to the series of questions you sent to us on June 8—and I understand those responses have been made available to members of the committee—we have attempted to be fully responsive to the subcommittee's interest in reviewing the method of contracting we are recommending and whether that method is in the best interests of the Government.

The contractors' proposals have been made available to officials of the General Accounting Office, under the arrangement worked out by the subcommittee, and we are able, without adversely affecting the integrity of the competition, to present the results of our lease versus purchase analysis for each proposal.

We hope that these results, together with the GAO report on the methodology used by NASA (B-185898, July 15, 1976), and the testimony of GAO officials here today will convince the subcommittee that our procurement approach makes sense from an economic point of view, whichever contractor is finally awarded the contract.

Because we are still in a competitive stage of the procurement we are constrained as to the data we can present in an open session.

If the subcommittee wishes we could go into somewhat greater detail in an executive session, following my presentation, with the understanding that any transcript of such an executive session would

be withheld from publication pending the actual award of a definitive contract.

I should report that the Federal Communications Commission ruled on September 8 that the provision of TDRSS services by either contractor to NASA will not be subject to regulation by the FCC as communications common carriage.

NASA had requested a declaratory ruling on that question to assure ourselves that we could enter into the type of fixed-price contract specified in our request for proposals.

A copy of an FCC press release concerning the decision has been provided to the subcommittee.

At this point it may be helpful to review quickly what the TDRSS contract will provide and how it will permit us to replace the ship, aircraft, and a majority of our ground tracking stations in meeting the tracking and data acquisition support requirements of the Space Shuttle era.

The system, itself, will consist of two specialized communications satellites in geosynchronous orbit and a ground terminal located at White Sands, N. M.

With TDRSS, data, including voice communications, can be relayed directly to and from the spacecraft and mission control centers.

Each satellite will be capable of simultaneous tracking and two-way communications with 20 or more scientific, applications, and manned spacecraft in Earth orbit at altitudes up to 5,000 kilometers.

The system will provide near-continuous coverage for all low-Earth orbiting spacecraft, and increase the coverage provided by the ground stations by almost a factor of 6 (from 15 percent to 85 percent).

Equally important is the increase in real-time bandwidth capabilities which will be achieved in that it permits us, as noted earlier, to phase out many of the facilities in the current network.

Let me turn now to the lease versus purchase analyses and describe briefly the methodology we used, which methodology as I have mentioned, has been reviewed and verified by the GAO.

Basically, there are four major steps involved in conducting a lease versus purchase analysis.

First, the cost proposals are expressed in constant dollars. The two proposals received for TDRSS services contained cost estimates which include a finite inflation or forward pricing rate.

These rates varied between the two firms and in order to provide a common basis for the lease versus purchase comparisons, the costs were converted to constant year dollars as of January 1977.

This is the month of planned contractor initiation of TDRSS effort.

The next step was to determine the total costs of the lease approach.

These costs are the summation of the contractor's fixed-price proposals and any associated Government costs, such as NASA civil service staffing.

These costs were time-phased by year over the life of the contract. Federal income taxes were then subtracted from the time-phased costs to yield the net cost to the Government.

The result is the net cost to the Government for the TDRSS services before accounting for the differences in the time value of money which I will discuss later.

The third step was to derive the equivalent cost of a Government-owned, or purchased system.

This estimate was obtained by using the hardware costs as submitted in the proposals and then deducting from other elements of the proposals those direct and indirect costs associated with a lease.

These included items such as financing, insurance, and overhead.

We then added costs which would be incurred in a typical NASA purchase to a prime contractor as well as the additional civil service staffing costs required for a Government-owned system.

All of the above costs were time-phased and, as in the case of the lease approach, Federal income taxes were removed to yield the net cost to the Government for a purchased system.

Having obtained the costs for a lease service and a Government-owned system as outlined above, the only remaining step was to account for the time value of money.

It is widely accepted, both in Government and industry, that the time value of money must be considered in any economic analysis.

This is of major importance when the cost patterns or cash flow are quite different, as they are, of course, under the lease and purchase approaches.

Our analysis used the conventional technique of discounting to account for these timing differences. Our previous analysis, which we discussed in February, used a discount rate of 10 percent which we felt represented the average rate of return in our economy.

In the latest analyses, which we have provided to the GAO for their review, we determined the lease versus purchase ration both at the 10 percent discount (consistent with OMB circular A-94) and at a 7¾ percent discount (which approximates the current yield on 10-year Treasury bonds).

The results for each contractor at those discount rates are as follows:

LEASE TO PURCHASE RATIOS

	10 percent discount rate	7¾ percent discount rate
Company A.....	0.81	0.92
Company B.....	0.85	0.96

We believe these results demonstrate that from an economic point of view using widely accepted economic analytical techniques our proposed TDRSS contract approach does make sense and would be advantageous to the Government.

As is typical in complex procurements, the Source Evaluation Board identified and presented to the Administrator programmatic and cost factors in each proposal which need to be resolved in negotiations leading to a final contract.

In addition to the lease versus purchase analyses based on the proposals themselves—which I have just presented and which have been verified by the GAO—we did an additional analysis to satisfy ourselves that the results were valid even if the negotiations did result in some adjustments to the proposals.

With respect to each contractor, the lease versus purchase ratios did not change in the first two decimal places.

In closing, Mr. Chairman, let me say that NASA is gratified that your committee and the Senate committee have endorsed from the beginning our technical approach toward meeting the support requirements of the 1980's through implementation of the TDRSS capability.

The only question—and I recognize that it is a significant one—has been whether NASA's proposed TDRSS service contract is an economical way for the Government to acquire that support capability.

We believe, and we hope you agree that our analyses do support a conclusion that from an economic viewpoint, the method of contracting is in the public interest.

Mr. Chairman, this concludes my prepared statement.

Mr. FUQUA. Thank you, Mr. Truszynski, for your comments.

At what level of the lease purchase ratio would you reject the lease in favor of the purchase?

Mr. TRUSZYNSKI. Mr. Chairman, that is an interesting question, and the obvious simplistic answer would be that at a ratio of greater than one, it might need to be looked at in a more harsh light.

This of course is further dependent on whether or not this method of obtaining a service such as TDRSS is worth perhaps a percentage point, in the lease purchase ratio, because of the larger beneficial effects to the Government that accrues from allowing industry to participate in these kinds of services.

However, I must say a ratio of one is the place that I would look at it very hard.

Mr. FUQUA. Well, when you let the industry provide the up-front money for the contract, what carrying charges or interest is the Government actually paying?

Mr. TRUSZYNSKI. We would expect the contractor to obtain this—

Mr. FUQUA. You are paying for it though?

Mr. TRUSZYNSKI. Yes, but the Government is also essentially standing behind the contractor, and we would expect that he could get money at essentially the current Government interest rate, which then would result in an effective interest rate of some 4½ percent, when one removes the Federal income taxes due on the interest income.

Mr. FUQUA. You mean to say they can get it at the same interest rate as if the Government went out to borrow it, even though it is guaranteed by the Government?

Mr. TRUSZYNSKI. I think I would ask my procurement representative to answer that question.

Mr. EVANS. I think we would expect it to come reasonably close, considering a Government guarantee is behind it. There may be some premium, which we will not know until we go further in the negotiations, but it should not be that far out of line from what we see in Government rates. We do recognize there will be a premium attached to it, but we do guarantee the payment in the terms.

Mr. FUQUA. Mr. Winn?

Mr. WINN. If there is a premium charge to it, would you allow that against the contract, if the contractor was getting the loan?

Mr. EVANS. If it were part of the negotiations, yes.

That would be an expression of the best cost of money he could obtain, and that would be part of his price.

In the final analysis, we are pricing a service in which the cost of money would be—

Mr. WINN. What allowables do you put in there at the present time when you are working on—is it possible they would finance their own, I am going way back into the work they are doing, you give them a contract, how do you judge what they will allow for their borrowing of money?

Mr. EVANS. Under the existing cost principles, I think this is what you are referring to, interest is generally not allowable.

This is a fixed price contract, and I think secondarily, one of the conditions of it is that industry would place this money, and one of the elements of it would be a form of assignment to a lending institution to guarantee a payback.

We have a different relationship there than we do in the normal kind of contract.

Generally we pay progress payments, and this is a different situation.

We would be making no payments before the institution of service in this case here, so I think the two differ rather significantly.

Mr. WINN. Have these two contractors that you picked, is there any possibility that at some time when you announce the prime contractor, or whoever wins the contract, that the other contractor could be an important part of that program, in other words, could they get together as a team?

They are teams now, I understand that, or does the loser just completely lose out?

Mr. TRUSZYNSKI. I would expect, Mr. Winn, under the way the present proposals are structured, one team would eventually win, and continue with the present team arrangement.

Mr. WINN. They would not be in a position to subcontract any parts of that, would they?

Mr. TRUSZYNSKI. At some lower level that may be possible, but I would suspect that the teams as arranged would continue.

Mr. WINN. You like this idea, two contractors like this?

Mr. TRUSZYNSKI. Mr. Winn, as we tried to point out, we have two acceptable proposals.

Mr. WINN. Both qualify?

Mr. TRUSZYNSKI. Both qualify, and it gets down now to a final decision between the two.

Mr. WINN. How much more money is it going to cost the loser, whoever the loser might be, to continue to go on, thinking they are going to get it?

If you made a decision now, compared to when you make the decision in the future, can you tell me that?

Mr. TRUSZYNSKI. That is hard to say, but again, Mr. Winn, we try to assure each firm that it may be required, that it may require this kind of schedule. Accordingly, we require a certain proposal time period for which the proposals must remain valid, and that period is consistent with the length of time we will need for the final negotiations.

Mr. FUQUA. When do you hope to conclude the negotiations?

Mr. TRUSZYNSKI. We will try to conclude them by the end of this year; that is our current schedule.

Mr. WINN. I thought that is what it was, but I was not sure.

You have answered most of our questions, I am referring to the ones we sent to you on June 8.

I do not know if there are any questions that our staff might feel were not answered in those responses or not, I don't know.

Go ahead.

Mr. FUQUA. On page 14 of the GAO report, under spacecraft, you have the estimated cost under purchase, or launch vehicles, \$131.5 million, and lease \$30.5.

What do these dollars represent, and what is the difference?

Mr. TRUSZYNSKI. The \$131 million in the purchase column includes the cost of the expendable launch vehicles that we need at the beginning of the program, as well as the shuttle launches in the latter part of the program.

The \$30 million in the lease column, specified under launch vehicle is the shuttle only launches.

The expendable launch vehicles are to be contractor-furnished under the lease and are included in the lease payment of \$607.8 million.

Mr. FUQUA. That is recouped back there?

Mr. TRUSZYNSKI. Yes, it is.

Mr. FUQUA. It is really a bookkeeping balance?

Mr. TRUSZYNSKI. Yes.

Mr. FUQUA. So that figure would be the same?

Mr. TRUSZYNSKI. It would be the same.

Mr. FUQUA. What do you estimate the potential savings from the phasing out of our overseas tracking stations?

Mr. TRUSZYNSKI. Mr. Chairman, that still remains to be a significant number.

Mr. FUQUA. And when might that occur?

Mr. TRUSZYNSKI. It would occur beginning about 6 months to a year after the initiation of TDRSS service.

As you recall, we plan to continue the present network until TDRSS is operational. At that point we would begin phasing out the stations, and that would occur over a period of about 1 year, beginning in the middle of 1980.

Mr. FUQUA. You do not know how much you are saving, how much your savings would be associated with the closing of that facility, of those facilities and the operational costs, etc.?

Mr. TRUSZYNSKI. I think perhaps the best way I might express that is in a benefits-to-cost ratio.

The benefits-to-cost ratio range, depending on which proposal is used, is still in the order of 1.2 to 1.3, and in that sense, you could conclude there is a significant savings, still numbered in the tens of millions of dollars per year.

Mr. FUQUA. In the GAO report, it talks about the lease purchase ratio in constant dollars.

You make constant 77 dollars, I believe.

Mr. TRUSZYNSKI. Yes, that is correct.

Mr. FUQUA. What effect does inflation rates have on these, or is that included in there?

What inflation rate are you using?

Mr. TRUSZYNSKI. The standard practice in making these kinds of analyses is to first translate the costs to constant year dollars, to remove any variations due to inflation.

However, if we were to use inflated costs, the lease purchase ratio would probably be slightly less favorable, depending on the inflation rate used. We would not expect to have a significant effect.

Mr. WINN. We are trying to figure out on your 75 analysis, you had 1.02 at a 10-percent figure, and 1.08 at an 8-percent figure, and now you are considerably below that.

Can you give us an idea why it came out below that?

Has there been any drastic change, if anything?

Mr. TRUSZYNSKI. Mr. Winn, that 1.02 is based on an inhouse estimate, and admittedly it was our best estimate of a lease approach and a purchase approach.

I can say that on the basis of the actual contractor proposals, and analysis of their cost streams, this is the ratio we arrived at. We reported during this spring's hearings that the composite ratio based on the initial contractor proposals had gone down to .98, so it is a difference between our original inhouse estimates and the actual proposals.

Mr. WINN. I have no further questions, Mr. Chairman.

Mr. FUQUA. If you will take a seat, we will now hear from the GAO, and I hope you will stay, if you can.

We may have another question.

We will now hear from Mr. Fred J. Shafer, Director, Logistics and Communications Division of the GAO.

He is accompanied by Mr. Firich and Mr. Nelson.

Please proceed, Mr. Shafer.

STATEMENT OF FRED J. SHAFER, DIRECTOR, LOGISTICS AND COMMUNICATIONS DIVISION, GENERAL ACCOUNTING OFFICE

Mr. SHAFER. Mr. Chairman, members of the subcommittee, we are pleased to appear here today to discuss the methodology used by the National Aeronautics and Space Administration to compare estimated costs of leasing or purchasing the tracking and data relay satellite system (TDRSS).

I have with me Mr. Donald L. Firich on my left, Associate Director in my Division, and on my right, Mr. Kenneth A. Nelson, Assistant Director in my Division.

On February 6, 1976, Congressman Wydler requested that we review NASA's methodology. In that review, we did not have access to cost data proposed by the two bidders and for illustrative purposes used costs developed and estimated wholly by NASA.

I understand that a copy of our report on that review (LCD-76-127, dated July 15 1976), has been furnished to each of you.

On August 4, 1976, Mr. Chairman, you requested that we follow up to verify NASA's application of its methodology—which we previously concluded was acceptable—to the actual cost proposals received from the two bidders and other related data.

As you requested, our review was directed solely toward verifying that NASA's comparison of the TDRSS lease and purchase cost for each bidder was based on an acceptable methodology and consistent with the supporting data.

On August 30, 1976, NASA made available to us the lease purchase computations and the competitors' cost proposals.

Consequently the time available to review NASA computations has been extremely limited notwithstanding the excellent cooperation and support furnished by NASA representatives during our review.

Mr. Chairman, I would like, at the outset, to emphasize certain aspects of the proposed procurement which our studies did not cover.

As both you and Congressman Wydler and the subcommittee staff directed:

1. We did not review the relative costs and benefits of procuring the TDRSS or retaining the present system.

2. We did not audit the bidders' cost proposals or make any independent assessment of cost data contained in the proposals or in NASA's cost estimates. However, the range of cost categories included in NASA's analyses seem to be complete, especially with regard to the categories that would differ between the lease or purchase alternatives.

3. We did not evaluate all of the numerous legal, technical, and business considerations involved in a procurement of the magnitude and complexity of the TDRSS.

4. We did not review the procedures NASA has established to select the TDRSS contractor.

We satisfied ourselves that NASA computed the lease/purchase ratio for each respective proposal consistent with the methodology which we previously found acceptable and consistent with the underlying data contained in the two proposals and related NASA analyses.

As you may know, the basic methodology in comparing the lease and purchase acquisition cost is to estimate the magnitude and timing of cost to be incurred under each alternative and convert the two estimates to their present values.

Estimated Federal corporate income tax recoveries are offset against both the lease and purchase alternatives to compute the net cost to the Federal Government.

NASA elected to express the relation of the total net estimated lease cost to the total net estimated purchase cost as a ratio.

A lease purchase ratio of less than one means that the lease alternative is less costly than the purchase alternative.

Conversely, a lease purchase ratio greater than one means the lease alternative is more costly.

Both proposals were based on the acquisition of TDRSS services on a lease basis. NASA also required that the bidders' lease cost proposals be structured to permit a comparatively straightforward derivation of the estimated cost to purchase a TDRSS system.

NASA computed lease/purchase ratios for each of the two bidders based on revised cost proposals submitted in August.

We reviewed the NASA computation of the lease/purchase ratio for each proposal. We reviewed the NASA analyses of the proposal data and the cost data contained in the two underlying proposals.

We also reviewed NASA estimates of TDRSS costs which would be incurred by NASA in addition to the contract costs.

We reviewed NASA computations to:

—Convert costs estimates contained in the two proposals to a comparable basis which excluded bidders' different estimates of inflation;

Derive the estimated costs of the purchase alternative. We satisfied ourselves that the purchase alternative acquisition costs essentially were based on proposal data and treated consistently in estimating the cost of the purchase and lease alternatives;

Amortize the contractors' estimated investment costs, which determined his financing costs, and calculate the present value of both the lease and purchase alternatives.

NASA made these calculations with computer assistance. We satisfied ourselves that NASA's computer programs resulted in reliable present value and amortization calculations.

Determine the estimated lease costs to the Government which were based on each bidder's proposed expenditures and the resulting need for debt financing.

In general, our review was directed toward assuring that each lease/purchase cost comparison was based on the proposal data and other NASA analyses both as to timing of incurrence and magnitude and that the costs were treated consistently in estimating the cost of the lease and purchase alternative for each proposal.

We conclude that the lease/purchase ratios computed by NASA were:

1. Computed based on acceptable methodology; essentially the methodology described in our July 15 report, and
2. Supported by cost data contained in the bidders' proposals and related NASA analyses both as to the magnitude of the cost and the anticipated timing of the cost incurrence.

In determining present value, OMB circular A-94 provides for use of a discount rate of 10 percent whereas GAO policy is to use the Treasury borrowing rate—assumed to be about 7.75 percent—as the more appropriate rate.

The lease/purchase ratios are significantly affected by the estimated recoveries of Federal corporate income taxes.

In computing the lease/purchase ratios for each contractor, NASA deducted from both purchase and lease alternatives an estimate of taxes that would be recovered.

OMB Circular A-76 dated August 1967 requires that Federal tax revenues be included in the comparisons.

Anticipated tax recovery was computed at 48 percent—the basic Federal corporate income tax rate—of estimated interest expense and prime and subcontractors profits.

Mr. FUQUA. Mr. Shafer, we will have to interrupt you for a temporary recess.

We have a quorum call to go to, and we will resume as soon as we get back.

The subcommittee will stand in recess for a short period of time. [Whereupon, the Subcommittee was in short recess.]

AFTER RECESS

Mr. FUQUA. The subcommittee will be in order. Mr. Shafer, you may proceed where you left off.

Mr. SHAFER. The lease/purchase ratios are particularly sensitive to the estimated tax recovery rate. For example, at a 10-percent discount rate, company A and company B lease/purchase ratios of 0.31

and 0.85, would be 1.05 and 1.11 respectively, if no income tax is assumed to be recovered.

At a discount rate of 7.75 percent the company A and company B lease/purchase ratios of 0.92 and 0.96 would be 1.17 and 1.23, respectively, if no Federal corporate income tax recoveries are assumed.

The significance of possible variations in the assumed tax recovery rate can be further illustrated by computing the tax rate that brings the lease/purchase ratios to one.

NASA analyses show that at a discount rate of 7.75 percent the lease/purchase ratio would be 1 if the tax recovery rate on financing costs is approximately 34 percent for company A and approximately 42 percent for company B.

This calculation contemplates that the recovery rate on contractor profits would be 48 percent.

The rate that Federal corporate income taxes will be realized on interest payments and profits during the lease period is subject to many variables and uncertainties.

The most significant amount of Federal income taxes expected to be recovered involves taxes related to interest payments to investors who will finance the procurement.

Under the lease alternatives, tax recoveries related to financing comprise the bulk of the estimated tax recoveries.

We understand that the types of institutional lenders who would finance TDRSS are unknown at present.

However, a financial adviser assisting a bidder in preparing its estimate indicated that pension funds, insurance carriers, and savings banks are strong potential sources of financing.

The latest data available from the Internal Revenue Service shows that for 1972 these sources had the following effective tax rates.

Pension funds exempt from Federal taxes:	Percent
Insurance carriers-----	36.05
Savings banks, savings and loans-----	46.22
Mutual savings-----	44.67
Banks and trust companies-----	33.16

In view of the uncertainty concerning the financing sources under the lease method, the differing rates of tax recovery from these sources, and the sensitivity of the comparative cost calculations to the tax recovery rate, we believe that the decision whether to lease or purchase should be predicated on factors other than the cost comparison.

In summary we believe that, in general, the methodology employed by NASA in comparing the costs of leasing the TDRSS with those of purchasing it is acceptable.

The precise numerical results might be debated, particularly in view of the sensitivity of the results to varying assumptions concerning the magnitude of tax recoveries resulting from the financing of equipment acquisition under the lease alternatives.

In our opinion, the results of the analyses support the conclusion that from the standpoint of net cost to the Federal Government, there is not a strong basis for concluding that either acquisition method—lease or purchase—is preferable to the other. Thus, we would suggest to the subcommittee that substantial weight be given to any other relevant considerations in arriving at a decision as to whether the TDRSS should be leased or purchased.

Mr. Chairman, that concludes my statement. We would be glad to attempt to answer any questions you may have.

Mr. FUQUA. Mr. Shafer, you were here, and you heard the question I asked Mr. Truszynski about the carrying charges and the effective interest rate.

How would you answer that, what the Government would be paying?

Mr. SHAFER. I would feel that at any given time the actual interest rate that the Government would be paying under the lease arrangement would probably be just slightly, if anything, above the rate at which the Government is borrowing. This is borne out by the statements in the record of the financial advisers to the bidders, who say that potential lenders, not being as familiar with a Government guaranteed loan of this type, might have a tendency to demand a slightly higher rate than the direct rates to the Government on its direct borrowings, so at any given time, I would say it might be just slightly above the Government rate.

Mr. FUQUA. Is it your opinion that all of the costs of tradeoffs, that are used to determine the lease/purchase, were grouped correctly and applied?

Mr. SHAFER. Yes, sir, we are satisfied that they were.

Mr. FUQUA. Now, the aspects of the discount analysis are rather sensitive, or sensitive to change, and they could materially alter the lease versus purchase ratio, could they not?

Mr. SHAFER. Yes, they can, and that is borne out by the fact that there are fairly substantial percentage differences between the lease/purchase ratios using 10-percent discount versus the 7.75-percent discount.

Mr. FUQUA. What would be your feeling of the impact of inflation on the analyses?

Mr. SHAFER. Well, basically, as Mr. Truszynski said, the purpose of the present value analyses is to reduce the competing proposals, under the purchase, or the lease, to a constant dollar basis, and, therefore, I would share his view that the effective inflation—except for wild inflation that cannot be anticipated at the present time—probably would not affect the ratio significantly.

Mr. FUQUA. Do you feel that they properly proceeded in regard to inflation rates at arriving at their analysis, or should that have been a factor?

Mr. SHAFER. No; I think they properly excluded inflation. Actually, the two bidders submitted their proposals, as I understand it, both containing somewhat different factors for inflation, and NASA factored out those differing inflation factors, reducing both bids to a constant dollar basis to make them comparable. I would say they appropriately excluded inflation from the computation.

Mr. FUQUA. Do you feel that the discount rates are realistic in the light of the possible tax recoveries?

Mr. SHAFER. Well, as I said in the statement, the General Accounting Office favors use of the current yield on Treasury borrowings rather than the 10-percent rate recommended in OMB Circular A-94.

As of August, the actual yield would be 7.86 percent, which is comparable to the 7.75 percent that NASA used.

We think it is more realistic to use the current yield on long-term Treasury obligations, so the 7.75 percent used in the NASA computation would be the one we would prefer.

Mr. FUQUA. Mr. Winn?

Mr. WINN. This could either be addressed to GAO or NASA, either one, maybe both of you would care to comment on it.

I just wondered what other relevant considerations should the committee give substantial weight to, other than lease/purchase ratio?

Mr. SHAFER. We thought of several factors. Since we believe that the present value computation results in a situation, given the uncertainty of the tax returns, where neither the lease nor the purchase option comes out significantly more favorable in the computation, the decision should be made on the basis of other considerations. These are such things as (1) whether we should expand the Federal payroll, which would be necessary to some extent under the purchase option; (2) the relative importance of the investment stream, taking into consideration that, under the purchase option, the Government would have to put rather large outlays in the early stages of this development whereas, under the lease option, they are really spread out over the period of the lease; (3) I think we should be concerned also about the fact that in the lease option, the risk is shared, whereas in the purchase option, the Government as a self-insurer would be assuming the bulk of the risk; and (4) the last point is, given the fact that developing the competence for assessing and evaluating a system of this type is not really essential to NASA's future, whether we should not continue to have that competence vested in the private sector.

There may be more, but in the short time we had to brainstorm these factors, this is what we came up with.

Mr. WINN. Under the lease option, then would this free significant manpower from NASA to do other work?

Mr. SHAFER. I do not think it would necessarily free NASA manpower to do other work.

I think within the framework of the alternatives we are discussing here, it would mean that NASA would not have to employ more people to assess, and do its management part of the system.

Mr. WINN. Well, from my point, I would just like to say this, I am sure this has been a lot of work for both NASA and GAO, but I feel very comfortable with your report, particularly when it is pretty obvious that you find that neither the lease nor the purchase agreement is preferable to the other, and to me, it is a good example of our checks and balances that we badly need in Government.

I want to commend both of you, and I understand that you had a very good working relationship between the two agencies.

Mr. SHAFER. It was, Mr. Winn. The NASA cooperation was outstanding, and without that cooperation, we would not be able to testify here today.

Mr. WINN. I think it was good for NASA, in respect to when they came up before, they really had not had this doublecheck on themselves, and I think it just caused them to look in the mirror a little bit, and I think they came out looking real good.

Mr. SHAFER. Yes, sir.

Mr. WINN. Thank you, Mr. Chairman.

Mr. FUQUA. Mr. Shafer, on page 8 of the NASA report, or NASA testimony, well, you have got the figures, you used it yourself, the ratios on the various discount rates used, under 7.75, is there really any real difference on a lease versus purchase ratio of 1, and the two values obtained at the .92 and .96, in the NASA testimony?

Mr. SHAFER. Would you give me the 1. plus figure you are talking about?

Mr. FUQUA. Is there any difference between the lease versus purchase of 1.0 and the two values obtained?

Mr. SHAFER. I see.

If it was not for the uncertainties in the recovery of taxes, I would say yes, there would be significance in those values, but given the uncertainties in the tax recovery element and the importance that the tax recovery element made in these computations, I would have to say that that percentage difference is not truly significant.

Mr. FUQUA. I have one further question to Mr. Truszynski.

Have you discussed this proposed plan with both OMB and the Office of Telecommunications Policy lately, and have their positions changed?

Mr. TRUSZYNSKI. We discussed this plan with both those offices, Mr. Chairman, and we have had no adverse comments so to speak from either office on this approach.

Mr. FUQUA. Has their positions changed any from the past?

Mr. TRUSZYNSKI. Not that we are aware of.

Mr. FUQUA. In the last 2 years that you have gotten worked on refining your report, there has been no change?

Mr. TRUSZYNSKI. No, there has not, Mr. Chairman.

Mr. FUQUA. Thank you.

Any further questions?

Mr. WINN. No further questions.

Mr. FUQUA. I would like to ask if either NASA or GAO has any further comments to make?

Mr. SHAFER. GAO does not, no, sir.

Mr. TRUSZYNSKI. No, Mr. Chairman, no other comment, but again to add my vote of appreciation to the GAO people who helped us in these analyses. I think it was an excellent assist from a knowledgeable group, and I would like, for the record, to say thank you to the GAO personnel involved.

Mr. FUQUA. Let me also commend both of you for working together on this.

I think that we have certainly come along with this in refining this matter, since it was initially presented to the committee, and I want to commend NASA for its openness and willingness to cooperate with the committee and with the GAO, and the GAO for its cooperation.

I think you have brought what I at one time had very, very grave doubts, and I will not say you have convinced me yet, but you have certainly brought a lot of sunshine into it, and I think what has transpired from the last couple of years has probably been good for both the Government, as well as the Congress, and I feel that we have the situation where we are talking about apples and apples and not apples and oranges.

At one time it appeared that is what we were talking about, and so I think from that, that there has been a lot of area cleared, and if we can move forward now in a more positive basis, and more basis of

assurance, that the decisions, the methodology we are using, in trying to arrive at a conclusion is going to be sound.

I think it is tested, and I think it will stand any test that is applied to it, so I know that as chairman of the subcommittee, I certainly feel better about it in making any recommendations to the full committee, or to the House, that you have certainly cooperated very fully with all of the requests that we made, and I think that we can at the appropriate time defend the position of a lease versus purchase arrangement, whenever it comes up for funding.

I am sure there may be other questions we will have, from time to time that may come up, but I have certainly been very satisfied with this.

I think Congressman Wydler has been satisfied. He was unable to be here, and he regrets it. The winding days of a congressional session, or a Congress coming to an end, and much is going on, and so I know he is very busy, and I know that Congressman Winn has been very busy, but we do appreciate the cooperativeness of all of you, and we hope that what we have learned will help us all to better understand the problem that we have, and I think in doing so will make this a stronger program.

The subcommittee will stand adjourned.

[Whereupon, the subcommittee was adjourned at 4:25 p.m.]

APPENDIX

QUESTIONS AND ANSWERS FOR THE RECORD

APPENDIX

LIST OF NAMES AND PLACES



National Aeronautics and
Space Administration

Washington, D.C.
20546

SEP 20 1976

TC

Honorable Don Fuqua
Chairman, Subcommittee on Space Science
and Applications
Committee on Science and Technology
Washington, D.C. 20515

Dear Mr. Chairman:

Enclosed are responses to the series of questions you
submitted on June 8 concerning NASA's plans to contract
for Tracking and Data Relay Satellite System (TDRSS)
services.

The responses are based upon the most current information
available and will serve as background to the material we
plan to present to the Subcommittee at the September 21,
1976 hearing.


Joseph P. Allen
Assistant Administrator for
Legislative Affairs

Enclosure

TRACKING AND DATA RELAY SATELLITE SYSTEM (TDRSS)

"A review of the elements considered to be of concern to the government vis a vis the authorization of a lease contract between the NASA and an Industrial Contractor are outlined below. The areas to be considered are categorized as follows:

- I Economic Concerns
- II Risk Concerns
- III Contracting Concerns

These principal categories cannot be completely isolated from each other, since each has an influence in some way upon the others. The following questions, however, try to isolate the principal categories wherever possible.

I Economic Concerns

The economics of leasing as opposed to purchase of capital equipment are related basically to the timing of outlays by the user or the buyer. The aggregate costs of leasing are by definition greater than the cost of buying, due to carrying costs attributable to the return of the seller's investment over the life of the capital asset rather than as its delivery. This difference is expressed as the "lease factor," which is the ratio of the incremental costs of leasing to the value of the asset when delivered to service."

1. Q. "What is the lease factor?"

- A. NASA is not leasing an asset but rather is contracting for telecommunications services. However, the economic merits of contracting for services versus purchasing a government owned system were compared via a lease to purchase analysis, which considers both capital investment and operational costs. NASA will present the results of this analysis during the upcoming hearings.

2. Q. "What are the details of the cost elements included in the lease factor?"
- A. As noted above, NASA conducted a lease-to-purchase analysis which included spacecraft, launch services, a ground facility and ground facility equipment, operations and maintenance costs of the ground facility and equipment for a ten (10) year period, ground data distribution costs, and civil servant staffing.
3. Q. "What elements of risk are included in the lease factor?"
- A. Under the provisions included in the TDRSS Request for Proposals, as amended in June of 1976, payments would be made by NASA at the fixed-price rate, subject to an economic escalation clause, if TDRSS services are begun and maintained throughout the 10-year service period. Insofar as contractually providing security for the lenders is concerned, we have structured a concept which we believe adequately protects the interests of the government and those of the lenders, either in the event of a termination initiated by the government or due to a failure by the contractor. Our concept, as expressed in contractual language, assumes an assignment of monies due the contractor to an assignee-lender pursuant to the Assignment of Claims Act. The contract will provide for a steady stream of payments by NASA to the assignee financial institution over the ten year service period. In the event of contract termination for any reason, the termination settlement would specifically provide for direct government payment of the assignee's investment. The government would have certain rights to take over the system and work in progress, and to proceed against the contractor to recoup funds paid the assignee in the event the termination was precipitated by a failure on the contractor's part. Under this provision, therefore, the contractor would be liable for and bear the risk of funds which would be recouped by NASA in the event any termination of the TDRSS contract was caused by failure on the contractor's part.
4. Q. "What is the source of financing?"

- A. Funds sources will be commercial sources and will be arranged by one or more of the Wall Street financing institutions (i.e., Salomon Bros., First City Bank, Lehman Bros., etc.).

5. Q. "Who owns the hardware during the operation phase?"

- A. Under the TDRSS contract NASA will be procuring TDRSS services during the 10-year period of the contract. During the entire period of the contract, title to hardware and other assets required to perform the contract would be vested in the contractor or other parties with whom it may subcontract. Although under the provisions of the Request for Proposals, as amended in June 1976, NASA would have the right to terminate the TDRSS contract and take over the system or work in progress, absent such a termination NASA would not have title to such hardware and other assets during the term of the contract.

6. Q. "What ownership and financing options were considered, and on what basis was the course selected made?"

- A. The Agency considered government ownership as well as industry ownership and, due to fiscal constraints, chose the latter when the lease-to-purchase analysis showed leasing to be a viable approach. In addition industry ownership is consistent with government policy of using industry services when available and practical (OMB Circular A-76). With regard to financing options the Agency did not consider financing options because with industry providing the services, the financing options would be of their choosing.

7. Q. "How secure is the source of funding during construction phases? Phases up to operation? After operation begins?"

- A. Before NASA enters into a TDRSS contract, the selected proposer must demonstrate that a commitment of financing has been obtained. Once entered into the contract would be legally binding for all aspects of the contract, including financing.

8. Q. "What surety is provided for financing availability which will guarantee against default, bankruptcy, or interruption of the project because of lack of money?"
- A. If satisfactory progress on the program is not maintained for any reason, NASA has the right to terminate the contract and take over the system and work in progress.

"The selection of the discount rate for cost of capital is important to the results of a comparison. OMB Circular A-94 recommends 10 percent on the basis of the "social cost" of alternative uses of capital. Some DOD directives have selected figures as low as 6 percent on the basis of the interest cost of long term government debt. Industrial firms may apply a figure of around 17 percent reflecting the cost of raising capital from debt, equity and earnings."

9. Q. "What cost of capital discount rate was selected for lease versus buy evaluation?"
- A. A 10 percent discount rate was selected for the original lease versus purchase analysis. At the hearing we will present our analysis at both 10% and 7 3/4 %, the approximate rate of yield on Treasury Notes.
10. Q. "On what basis was this rate selected?"
- A. Initially, cost benefits analysis were calculated using a 10 percent discount rate as prescribed by OMB Circular A-94. Subsequently, when lease versus purchase analysis were considered and calculated the 10 percent discount rate was used to provide consistency in the two analyses. The basis for 7 3/4% is noted above.
11. Q. "What would be the effect of higher or lower rates on the outcome?"
- A. The analysis is sensitive to the discount rate. The use of a higher discount rate favors the lease approach, a lower discount rate favors a purchase approach.

12. Q. "Are lease payments by the government level overtime, or variable? If variable (front loaded or back loaded), on what basis?"
- A. The contract payments are planned to be monthly and equal over 120 months, subject to periodic economic price adjustments and service outage rebates.
13. Q. "If a hybrid system is proposed, what is the guaranteed lease cost ceiling?"
- A. The guaranteed lease cost ceiling will be the contract price (fixed price) which in turn will be based on the proposed costs submitted by the contractors.
14. Q. "On what basis are the charges established? What proportion of total system cost is to be borne by (recovered through) lease revenues for the government?"
- A. The shared system costs would be pro-rated on the basis of proportionate use of the system. The share of total system cost to be borne by the government, should a contractor with a shared system be selected, would be determined in negotiations and would be fixed in the awarded contract.
15. Q. "What provision is proposed for reduction of government lease costs if commercial success is greater than forecast?"
- A. There would be no provision for reduced costs to the government should the commercial system be more successful than forecast. Conversely, the government would not bear any of the possible losses from the commercial portion of the system. The FCC ruled on September 8, 1976, that the provision of TDRSS service to NASA will not be subjected to regulation as communications common carriage.
16. Q. "Will the financial books be separate, available and open for government audit as related to the above considerations?"

- A. NASA proposes to enter into the TDRSS contract at a fixed rate for services, subject to an economic escalation clause based upon an appropriate index as published, for example, by the Bureau of Labor Statistics.

The lease versus purchase ratios will not change through the introduction of economic price adjustments since such adjustments would apply equally to the TDRSS service contract or a NASA-owned arrangement.

In its ruling on September 8 the Federal Communications Commission would require either contractor to provide TDRSS service through separate corporate subsidiaries with separate books of account. Each carrier would be required to identify all TDRSS costs and be prepared to show the FCC that they will not have used common carrier services to subsidize, to any degree, non-regulated TDRSS service.

The contract will include audit provisions permitting the government to examine the records of the contractor and his subcontractors up until three years after final payment.

17. & 18. Q. "What proportion of the casualty risk costs within the lease factor is allocated to the TDRSS segment of the hybrid system? On what basis was equitability of this proportion determined?"
- A. Since the assets will be owned by the contractor (or subcontractors) and since the contractor will conduct the operation and maintenance, the contractor will carry insurance and the premiums will be included in the contract price.

"Recent effects of inflation on government programs have led to consideration of costs escalation (or de-escalation) provisions in the TDRSS lease contract. It seems clear that such provisions are valid to cover uncontrollable cost shifts during Design, Development and Test which covers a period of 2 to 3 years. Such costs determine the capitalized value of the asset, to be finalized at the beginning of

service delivery and to be returned through lease payments. However, the application of escalation criteria over the payback life of the lease is less clear. Therefore:"

19. Q. "For what contract phases is escalation to be applied?"

A. Economic price adjustment (escalation) provisions will be available for both the implementation and service phases of the contract.

20. Q. "On what basis (formula, index, etc.) is escalation determined?"

A. Economic price adjustment means will be determined at contract negotiations and will be based on independent indices such as appropriate published Bureau of Labor Statistics Indices.

21. Q. "To what elements within the lease factor is escalation to be applied, if any, during operations?"

A. During the operations phase the RFP offers economic price adjustment for labor rates and material unit costs.

22. Q. "Will the contractor be willing to subject himself to audits which will substantiate changes in the lease factor?"

A. See answer to question #16.

23. Q. "In the case of a leveraged lease, to what formula will the interest on the bonded indebtedness be determined at the point of refinancing between construction and operations?"

A. Neither contractor is proposing a leveraged lease.

II Risk Concerns

"Assuming that the NASA is to cover the liability for the risks of catastrophic loss during launch and boost, the most pregnant risk to the lease contractor is catastrophic loss of the spacecraft in the subsequent period of activity. Several options may be available for protection from such a loss such as Commercial Insurance coverage, contractor self insurance or possibly government assumption of catastrophic casualty losses by way of "full government faith and credit" contract terms. Any assumption of risk by NASA implies some degree of technical surveillance and program management role during DDT&E phase. Therefore:"

24. Q. "By what means, or combination of means, does the contractor propose to offset the risk of casualty loss?"
- A. The government will not hold the contractor liable for any loss resulting from launch operations for which the government is responsible. For other phases of launch and orbit operations, shipping, etc., the contractor may obtain insurance coverage as is normally obtained for commercial launches.
25. Q. "How much (or how many) casualty losses can be absorbed before the undertaking is no longer viable to continue? On what rationale was this contingency limit established?"
- A. The contractor may carry in-orbit operational insurance for casualty loss which will be a function of his contract with the insurance firm. Aside from the protection provided by insurance, the contractor will provide up to a designated number of spacecraft, and this number limits his liability. This number is based on an analysis designed to provide 95+% assurance of ten (10) years service.

26. Q. "To what degree will the contractor instrument his spacecraft such as to determine causes or potential causes of casualty on any given launch so that corrective actions can be taken?"
- A. Diagnostic telemetry is planned for all subsystems with particular attention focused on the launch development sequence.
27. Q. "Assuming that the contractor assumes all financial risk for spacecraft loss following boost separation, does the NASA propose to impose additional penalties for contract non-performance or for added launch vehicles?"
- A. Yes, the contract will include penalties for service outage which are a function of both the extent and duration of service outage. The contractor's insurance will cover costs of additional expendable launch vehicles to a limit to be determined by the insurance contract.
28. Q. "If the provisions for assumptions of casualty losses in the proposals are such as to make the economics of the lease unacceptable, will NASA reconsider the lease contract structure so as to relieve such costs to an acceptable level? What form might such revision take?"
- A. Yes. The June 1976 amendment to the RFP reflects the NASA assumption of additional risk and provides for cost sharing with the contractor for additional spacecraft, beyond the number of spacecraft required to provide a 95% assurance of service over the ten (10) year service period.
29. Q. "Would the NASA propose to assume its traditional role of technical surveillance over the DDT&E and launch phases, if the government is forced to absorb some liability for casualty risks?"
- A. NASA will maintain a degree of technical surveillance to assure that satisfactory progress is being made.

"During the operational phase, there is a possibility of partial failure which would limit but not terminate the performance of one (1) or more spacecraft. Some minimum service level would likely be specified to establish the requirement for a new spacecraft replacement. In the case of hybrid outages, the warranty or incentive provisions could become quite complex. Therefore:"

30. Q. "What are the provisions covering partial spacecraft failures, and the incentive/penalty plans related to them?"

A. Outage penalties will be imposed, which are a function of both extent and duration of service outage.

31. Q. "Does the non-NASA segment of a hybrid system have any influence on probability or partial or complete failure of the NASA system? How does this factor reflect into the costs to the government?"

A. To the extent that the commercial and NASA payloads are supported by common subsystems, a catastrophic failure of the commercial payload might cause damage to a support subsystem and affect NASA service. This slight risk, however, is more than offset in the proposed shared system by the additional payload redundancy provided by the capability to reconfigure components from the commercial payload into the NASA payload.

With regard to cost, the overall effect of a shared system would enhance system reliability; this additional benefit was not counted in the analysis.

32. Q. "What incentives are planned to account for over-specification service to the government, including extended life?"

A. The June 1976 amendment to the RFP provides that if less than the projected number of spacecraft are required to provide ten (10) years service, the contractor and government will share in the cost savings.

III Contracting Concerns

"The potential lease type contract opens the possibility for the involvement of other parties in addition to the customary buyer and seller relationship NASA is most familiar with:"

31.a.Q. "To what extent will other than NASA management and prime contractor management be included in the management of the lease contract?"

A. NASA will enter into a TDRSS contract only with the selected contractor and NASA's management of that contract will be conducted with that contractor's management personnel.

32.a.Q. "Will there be any inhibition or complexity added to the one-on-one relationship between customer and supplier?"

A. The concept included in the TDRSS Request for Proposals, as amended June 1976, assumes an assignment of monies due the contractor to an assignee-lender pursuant to the Assignment of Claims Act. It is not envisioned that such an assignment would involve any inhibitions or added complexity.

"Assuming that the operation of the ground segment could be outside the scope of the lease contract."

33.-36.Q. "Who will run the system? How are managing interfaces specified? How will the flow of non-NASA system elements be accommodated for a hybrid approach, how interfaced and/or how isolated, and how will interrelated costs be segregated? What type of contracting is contemplated for operations? Competitive, call, with the lease?"

A. The operation of the ground segment will be included in the TDRSS lease contract.

37. No Question Provided

IV General Questions

38. Q. "What is the impact, if any, on a declaratory ruling by the FCC requiring the system to be covered under its regulatory powers?"
- A. On September 8, 1976, the FCC ruled that the provision of TDRSS service to NASA will not be subject to regulation as communications common carriage.
39. Q. "Will NASA require or request a re-competition of the spacecraft acquisition of the procurement prior to award?"
- A. No re-completion is planned.
40. Q. "Prior to a fully operational TDRSS, are there any plans to use ATS-6 or the CAS systems to support Shuttle thereby closing stations earlier than presently planned?"
- A. NASA does not plan this mode of operation since in this time frame the ATS-6 useful life will have been exceeded. There are no other systems compatible with the Shuttle data requirements without major hardware modifications to the Shuttle.
41. Q. "Does NASA have any plans to phase down its STDN prior to TDRSS operation?"
- A. Prior to TDRSS operations, no further phase down of the present network configuration is planned.
42. Q. "Please provide low earth-orbital Mission Model which will be on-orbit and which require STDN and/or TDRSS coverage from 1979 through 1984."
- A. A mission model currently being used in NASA planning is given in Attachment A.
43. Q. "Please define associate NASA operations' which will be required to support the TDRSS."

A. NASA's operations required to support TDRSS are limited to launch support only. This activity terminates with the initial placement into synchronous orbit of each TDRSS.

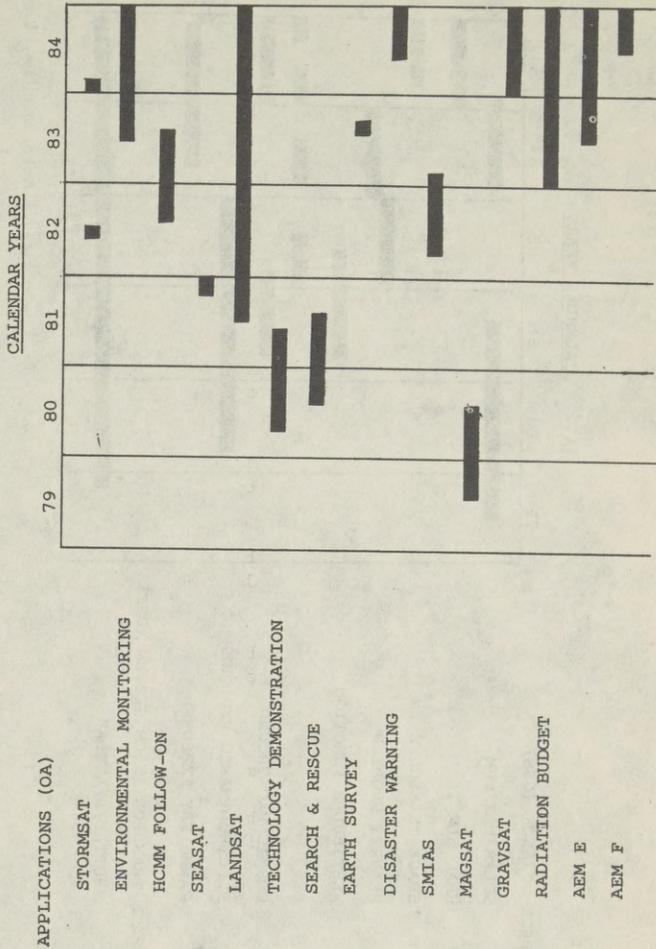
44. Q. "Has NASA defined plans for Ground Data Distribution to cognizant parties subsequent to TDRSS?"

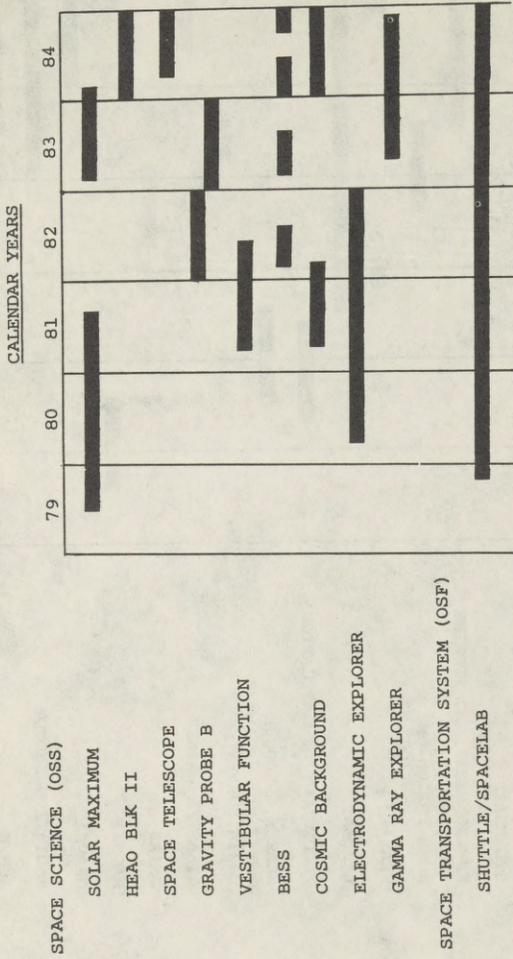
A. Yes. NASA has adapted specific plans for data distribution to users of the TDRSS. The distribution concept is an extension of our existing NASA Communications (NASCOM) capability employing high-speed digital data circuits available from commercial carriers.

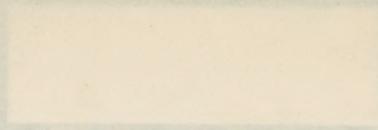
45. Q. "What constitutes GFE to the TDRSS contractor?"

A. Use of government owned land at White Sands, New Mexico, and Space Shuttle launches for replacement TDRSS spacecraft will constitute GFE to the TDRSS contractor.

OFFICE OF TRACKING AND DATA ACQUISITION
 TDRSS SUPPORT PLANNING MODEL









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