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PLANNING GUIDE FOR 2500 MEGACYCLE INSTRUCTIONAL TELEVISION SERVICE.

MICRO-LINK SYSTEMS, COPIAGUE, N.Y.

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THIS BULLETIN IS A GUIDE FOR EDUCATIONAL INSTITUTIONS WHICH ARE PLANNING INSTRUCTIONAL TELEVISION STATIONS OR NETWORKS. STEPS ARE OUTLINED FOR PLANNING AND INSTALLING AN ITV SYSTEM. THREE EXAMPLES ARE GIVEN FOR SYSTEMS OF VARYING LEVELS OF COMPLEXITY. THIS IS NOT A DO-IT-YOURSELF GUIDE, BUT AN OUTLINE OF THE MAJOR ELEMENTS OF A SYSTEM IN TIME SEQUENCE REQUIRING CLOSE COORDINATION BETWEEN THE EDUCATOR AND THE CONTRACTOR. COMMENTS ARE MADE ON THE PROJECT MANAGER CONCEPT AND DIAGRAMS AND ILLUSTRATIONS OF EQUIPMENT ARE INCLUDED. (JT)

PLANNING GUIDE FOR 2500 MEGACYCLE INSTRUCTIONAL TELEVISION SERVICE

This bulletin is a guide for educational institutions which are planning Instructional Television stations or networks. It outlines the steps required to plan and install an ITV system. Three examples are given for systems of varying levels of complexity. This is not a do-it-yourself guide, but rather an outline of the major elements of a system in time sequence. These several elements require close coordination between the educator and the contractor. Comments are made on the Project Manager concept.

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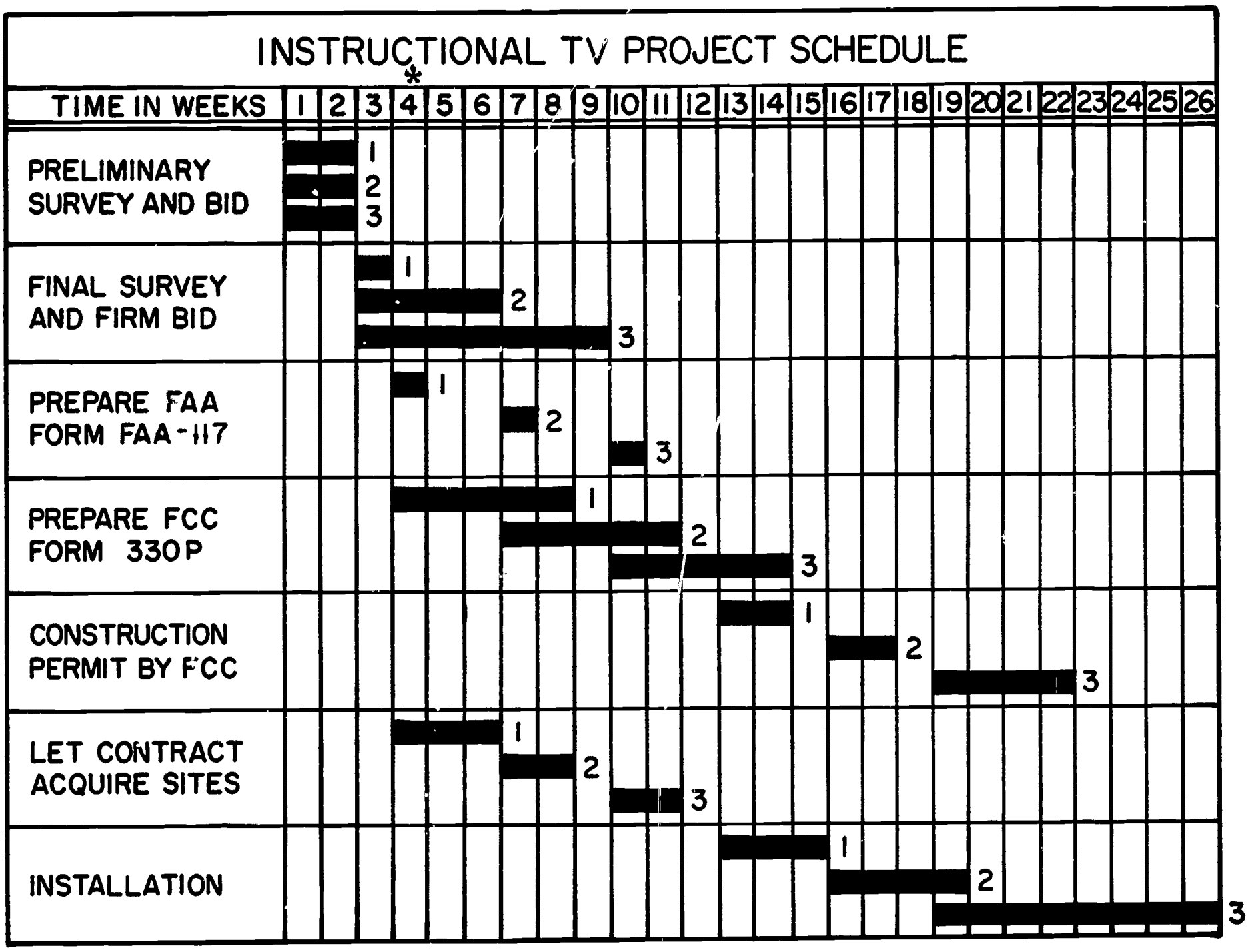


* Lines marked 1, 2 and 3 are examples of ITV Systems of three different levels of complexity for illustrative purposes.

2500 MC Instructional TV Service

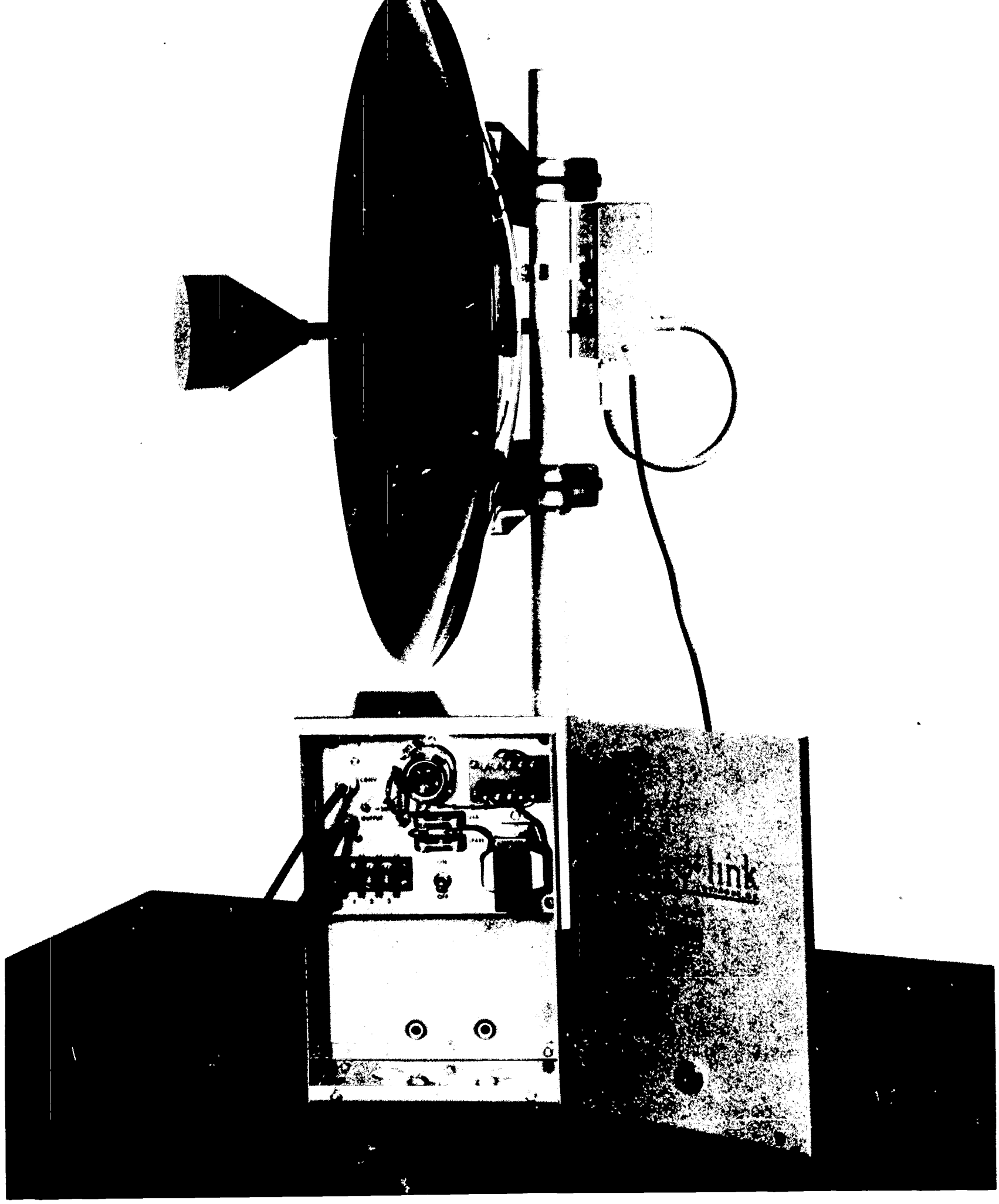
This new service is a microwave communication medium authorized by the Federal Communications Commission for the transmission of television signals for educational purposes. It is a special form of transmission capable of distribution of TV in a private, locally controlled closed circuit. 2500 Megacycle ITV makes possible the linking of many buildings within a school district or college campus without the cost and technical problems inherent to cable-connected systems. It is available to all educational activities - public, private, commercial or industrial. With this medium, TV programs originating live or from film or video tape may be transmitted. This bulletin is a guide for institutions planning their own systems.

Project Manager Concept

From the large and complex systems of the aerospace industry, there has developed a management technique called the Project Manager concept. This technique is very useful in managing a project involving many different fields of knowledge, and requiring the integration of many events in proper time sequence to reach the desired objective. This approach will be very useful in the planning and building of ITV systems. In its usual form the concept includes the best features of both individual authority, responsibility and committee action. An individual is delegated as project manager with sufficient authority and responsibility to see the project through to completion. A team of interested persons possessing the necessary special knowledge and skills is formed to give guidance to the project manager and as a means of efficient communication. In the case of ITV, both the user and the contractor should have a project manager. The team for the educator may include the Superintendent, Business Administrator, Attorney, Audio-Visual Director, Buildings Supervisor, and, in the case of new construction, the Architect. The contractor will use the project manager to negotiate technical details with the educator, administer any subcontracts, coordinate the activities of the factory and subcontractors and supervise installation and training of school personnel.

Project Schedule

The accompanying graph illustrates the major steps and the elapsed time required to install an ITV system. Three examples are given. The first example is for a typical compact school district in a heavily populated suburban area of generally flat terrain. The second example is one of increasing difficulty in



21 db two-foot parabolic 2500 megacycle receiving antenna with weather guard, including converter and power supply.

is that the manufacturer requires some lead time to prepare equipment for shipment to the site. Although equipment design is standardized, there are often minor adjustments or modifications which must be made for specific systems. Where changes are minor, the manufacturer can usually deliver equipment to the site within 30 days.

The earliest date at which a contract could be formed would be following completion of the final survey and establishment of firm prices, and the latest would be six to eight weeks prior to the expected date for granting of the Construction Permit. This is not the most desirable type of contract because there would need to be a number of "strings" attached to protect both parties against the possibility that the Construction Permit may be denied and that suitable sites may not be available. A safer course would be to wait until the Construction Permit is granted, but this would extend the time required to get "on the air".

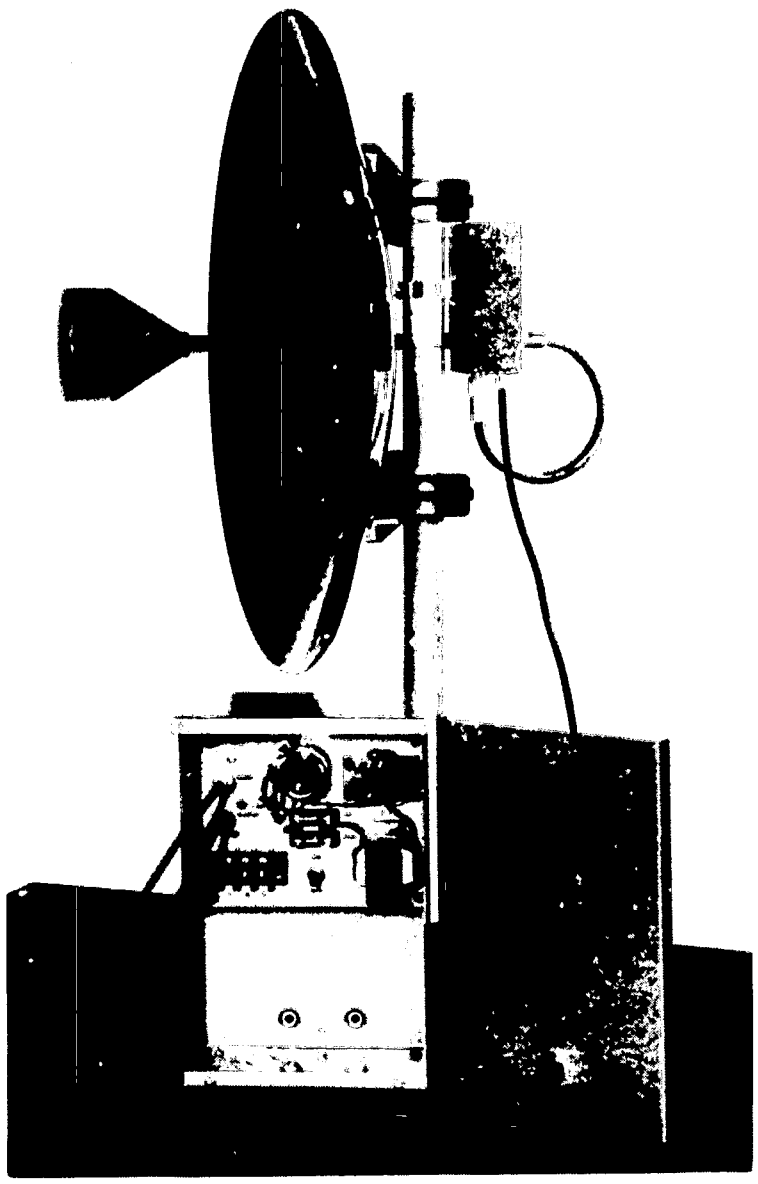
Installation

As stated previously, the first five steps shown on the chart must proceed in the sequence shown leading up to the granting of a Construction Permit. The forming of contracts and the beginning of installation are somewhat independent but related to the five step sequence. The FCC regulations do not permit the starting of installation prior to the granting of the Construction Permit, and the permit requires that construction begin in 60 days and be completed in six months. As stated above, contracts must be formed in sufficient time to allow the contractor to prepare equipment, form subcontracts, and the like. The chart shows the shortest possible time for completion of a project; that is, the case in which the contract is formed at the earliest possible time in order that installation can begin as soon as the Construction Permit is issued. Later formation of contracts would, of course, mean later completion than shown in the chart.

Summary

The time schedule shown in the charts and accompanying remarks are a simplified situation and demonstrate the minimum time in which it can be realistically expected that a system could be in operation. No consideration has been given to the funding aspect; this is assumed as already provided. It is also based on an element of risk in forming contracts prior to issuance of the Construction Permit. It is shown that a period of three to five months to accomplish the steps is necessary to

MODEL #CE-5 RECEIVING CONVERTER



The Model #CE-5 Instructional Television Receiving Converters are designed to provide "state of the art" reception at minimum cost. With suitable channel assignments, the converter can receive up to five alternately spaced channels without objectionable interference. Actual field usage has exceeded the design reliability goal of an average ten year interval between repairs. The photograph illustrates a typical installation showing mast-mounted CE-5 Converter and AE-2 Antenna. The associated Power Supply is shown in foreground.

TECHNICAL SPECIFICATIONS

Input Frequency Range:	2500 to 2686 mc/sec
Output Frequency:	168 to 222 mc/sec
Power Gain:	18 db typical, 16 db minimum
Passband Ripple:	Within 2 db across passband
Noise Figure:	8.5 db typical, 10.5 db maximum
Input Impedance:	50 ohms
Output Impedance:	75 ohms
Frequency Stability:	.005% or better obtained through crystal control
Maximum Input Level:	-35 dbm (4 millivolts) for 1% intermodulation (five channels)
Reliability:	Completely solid state circuitry
Operating Temperature:	-40 to +140°F
Mechanical Construction:	Two piece construction consists of antenna mast-mounted converter and associated indoor mounted power supply. Converter completely weatherproof, light weight and provided with necessary mounting hardware. Single coaxial cable supplies power and transmission of converted signal.

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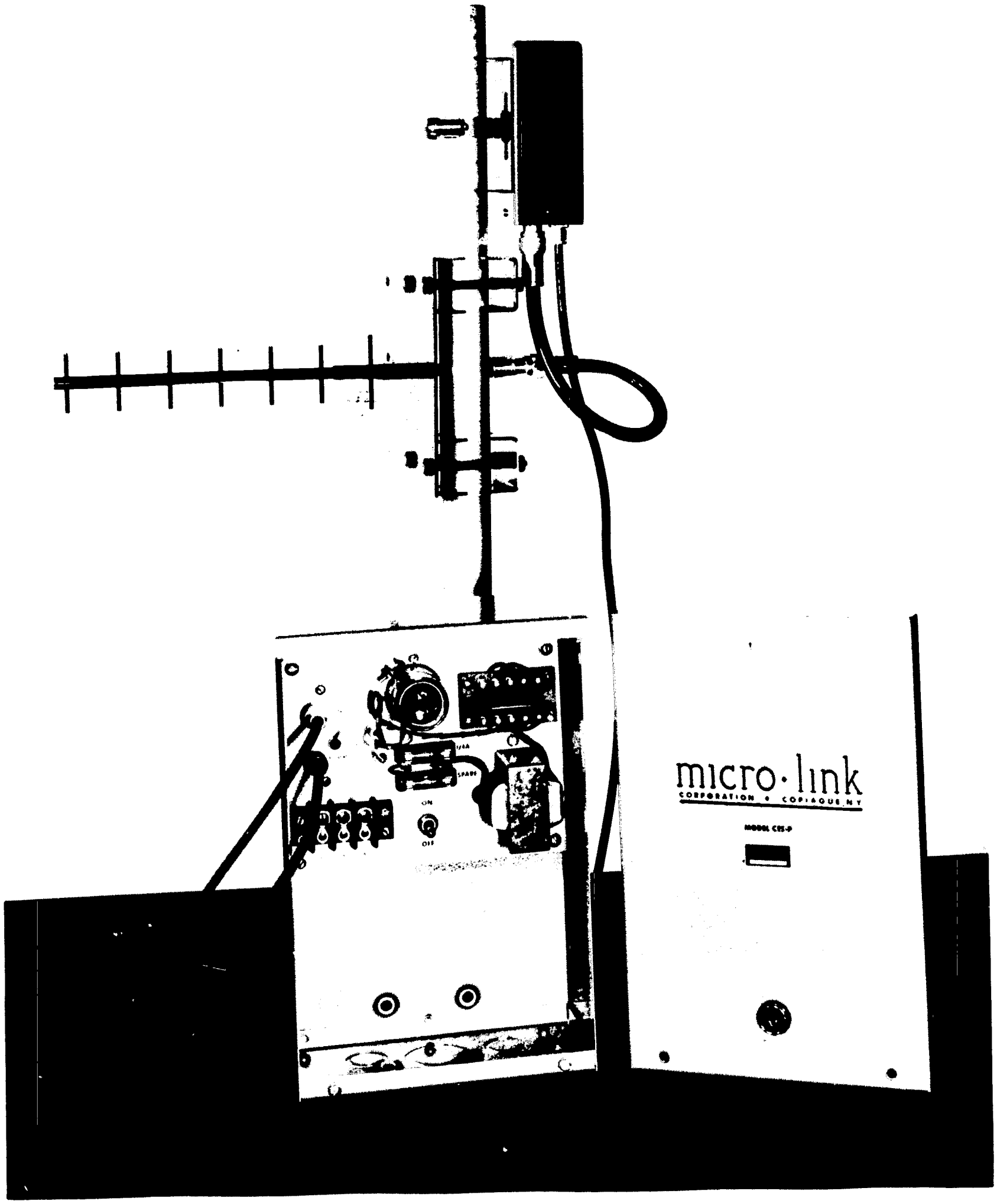
receive a Construction Permit. If the conservative approach is taken and contracts are not formed until the permit is obtained, then it will take five to nine months to put a system in operation. Another simplification is that this analysis has been based primarily on the microwave equipment. In the case of a complete new system including studio, receivers and distribution equipment, the added complexity will require even more precise project management.

As a typical example, suppose that a public school district wishes to install a simple system in time for operation at the beginning of the school year, September 1st. Assuming that the fiscal year begins on July 1st, this date would be none too soon to allow the contractor time to complete the work. This means that plans should be made to obtain a Construction Permit in June. Since FCC Form 330P requires information about the specific equipment to be used, the school district must select a contractor in mid-April for timely submission of the application. Initial planning and estimating should, therefore, start in January or February at the latest.

Each ITV system is somewhat unique, with its own set of problems. For professional assistance in planning an ITV project, an inquiry directed to Micro-Link Corporation will receive prompt response.



13 db gain Yagi 2500 megacycle receiving antenna, including converter and power supply.
(ANOTHER STATE OF THE ART ADVANCE BY MICRO-LINK)