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CHAPTER 4. Logistics and Preparatory Work

(Page numbers here omit the chapter prefix, 4 – , which appears as part of the number of individual pages. The prefix indicates the location of the material in the final consolidated edition of the **Procedural History**.)

Chapter 4. LOGISTICS AND PREPARATORY WORK

INTRODUCTION

As early as 1964 the Bureau began to plan acquisition of the large volume of supplies and equipment needed for the Nineteenth Decennial Census in 1970, and to determine the facilities required for its field operations. These plans included the development of specifications, the purchasing of necessary materials, their distribution, and their disposal after the enumeration was completed.

Assisting the Bureau of the Census in both planning and support activities for the 1970 census were the GSA (General Services Administration) and the GPO (Government Printing Office). Both of these agencies had major roles in the procurement of material, and GSA assisted in the acquisition of space and communications facilities and in the disposal of surplus office equipment and supplies subsequent to the data-collection phase of the census.

The procurement of field supplies, equipment, and materials is described below; the design and procurement of envelopes, questionnaires, and instruction sheets, their assembly into appropriately labeled mailing packages, and their delivery to households are discussed in subsequent sections. The Post Office's role in preparing for the enumeration is described on pp. 19ff.

The costs for the Nineteenth Decennial Census shown in this chapter include depreciation (where applicable), but they do not include the cost of general administration, other general expense, or capital outlay which were recorded only at the appropriation level. These costs are shown in the 1970 Census of Population and Housing cost summary in chapter 1 of the procedural history.

PROCUREMENT OF FIELD SUPPLIES, EQUIPMENT, AND MATERIALS

Intensive research was begun in 1964 for development of specifications for such major equipment and supply items as inexpensive cardboard tables to be used in place of desks, plastic files in place of steel shelving and filing cabinets, cardboard briefcase portfolios for use by enumerators in the field, and shipping containers. Standard items were used when practical, but many items had to be developed to meet the Bureau's particular needs. This required research as well as consultation with specialists in other Government agencies and with various manufacturers.

Supplies

Exactly 170 supply items (other than printed matter) were required for the 1970 census field work. There were 101 standard items plus 69 special items (including 16 for Puerto Rico) for which specifications had to be developed. Extensive research was required for about 35 percent of the special items.

Quantities of supply items varied from a few hundred to over a million. Some of the more significant items and quantities ordered are described below.

The Bureau purchased 1.8 million paperboard cartons of various sizes for the packaging of training kits, enumerators' supplies, and the shipping and storage of completed questionnaires. Most cartons were of stock sizes produced by commercial manufacturers, but a special size carton was purchased for shipping census materials to the district offices. This special carton allowed the packing together of numerous small items in stated quantities to provide a standard supply of all the items needed to open a district office.

The Bureau procured 1.15 million black-lead pencils, similar to the ones used in the 1960 decennial census, at a cost of approximately $23,000, and 305,000 small plastic pencil sharpeners, for use by enumerators, at a cost of $4,700. Approximately 0.5 million colored pencils were purchased for the use of edit clerks, at a cost of $13,580.

The Bureau purchased 180,000 plastic portfolios, at an approximate cost of $293,500, for the enumerators to use to carry their census materials, and also 270,000 enumerator identification cards and card holders for $6,585. The cards were of a size large enough (2-1/2 x 4") so that householders could read the identification in dimly lit hallways, through windows, or even through sight holes in doors. Two hundred thousand large, heavy-duty paper shopping bags were obtained for $9,500; these bags were used by the enumerators in decentralized mail areas to carry questionnaires from training locations to their homes and were also used by crew leaders in all district offices to carry miscellaneous materials.

All district offices used cardboard bins in place of conventional steel filing equipment. Each mail census district office, for example, had a large central bin file for the collection and control of the incoming questionnaires, with one bin for each of 600 to 800 enumeration districts. In addition, smaller supply bins and special operation bins were used for processing the completed questionnaires prior to shipping them to Jeffersonville. The district offices used approximately 150,000 large bins at an average price of $0.30 each, and about 315,000 smaller bins at an average cost of $0.10 each.

Most supplies for field work were ordered for direct delivery to the Bureau's Jeffersonville, Ind.,

facility, with the exception of a standard kit of general office supplies that was delivered to each district office on its opening day directly from the GSA Federal Supply Center having jurisdiction. Most of the supplies were needed in Jeffersonville early in 1969, 3 to 6 months earlier than was required for the 1960 census. This was primarily because of: (1) the need of certain supplies required for the 1969 fall listing operation in 117 decentralized districts; (2) the very large number of individual supply and training kits to be prepared; and (3) the large number and quantities of items to be procured, warehoused, and then staged into one large initial shipment for each district office.

Equipment

In 1964 the Bureau began to develop inexpensive substitutes to be used in the 1970 census for desks and tables. Early over-all planning was pointed toward a mail census, and it was known that several times as many district office clerical workers (as distinguished from enumerators) would be required as were required in the 1960 census--twice as many for the decentralized and eight times as many for the centralized offices.

GSA officials advised that surplus furniture from other Government agencies would not be available in the large quantities needed for the 393 district offices to be established for the 1970 census. Even if it had been, the warehousing and shipping cost per unit would have substantially exceeded that of low-cost disposable tables with the durability to last 3 to 4 months. Rental also was considered and found to be nearly as expensive as buying new standard wood or metal tables and chairs. The Bureau had developed and tested a plywood table in the 1965 Cleveland test census that cost about $8.00 per work station. It was easy to assemble and the heavy components (3/4" plywood tops and 2" x 4" legs) could be obtained from local lumber yards.

After the Cleveland test census, however, the use of even less expensive cardboard tables was considered. In mid-1966, the Bureau purchased and tried out a patented cardboard table; 125 of these were ordered for all clerical operations in the New Haven test census office in 1967. These tables were lightweight and could be moved easily by anyone to another part of the office as clerical operations shifted. They served the census needs very well. Most of these cardboard tables were reused the following year in the 1968 dress rehearsal censuses.

A plan therefore was developed to supply each district office manager with a standard flat-top desk and a rotary chair, certain staff members with cardboard tables and rotary or typists' chairs, and the remainder of the employees in the district offices with cardboard tables and folding chairs. The Bureau proceeded through GSA to develop specifications for 25,000 cardboard tables, size 27" x 60" x 30", for use at work stations, and 1,700 cardboard tables, size 27" x 36" x 27", for use as typewriter stands, at an average cost of less than $4 each for both types.

Inexpensive metal folding chairs, costing $2.55 each, were used for all short-duration clerical work stations in 1970 census offices; about 21,500 work stations thus were provided at a cost of about $6.50 each. Regular typist or swivel chairs were furnished for full-time district office personnel only. A comparison of this cost to that for local rental of desks or tables and chairs for a period of 5 months, estimated to range upward from $40.00 per work station, resulted in a savings to the Bureau in excess of $500,000. (Since cardboard bin files had been used for a large portion of the files in the 1960 census and had proven satisfactory, no savings in 1970 can be claimed by comparing the cost with that of shelving and file cabinets.)

Approximately 1,900 adding machines, 393 printing calculators (one per district office), and 786 manual typewriters (two per district office) were rented locally. Most of the adding machines were needed for only 1 or 2 months, during the population and housing count.

Procedures were established to dispose of the equipment in the district offices as soon as possible after the enumeration. Typewriters, adding machines, and other office equipment that was rented locally was returned to the suppliers when the offices closed. (The Bureau had to reimburse lessors for 54 adding machines, 11 calculators, and 11 typewriters that were reported stolen.) A report listing the remaining property at each office was sent to the proper GSA regional office for review for possible future Federal utilization. The procedure for the disposition of equipment after the 1970 census was greatly simplified by having only the following four items of accountable equipment: flat-top desks, swivel chairs, typists' chairs, and platform trucks. There were seven items of nonaccountable equipment: folding chairs, cardboard tables (two types), coat racks, fire extinguishers (two types), and hand trucks. Since these items were the same in each district office, preparation of the disposition forms was facilitated.

Some furniture or equipment was transferred elsewhere within the Census Bureau. The bulk of the property, however, was declared excess; much of it was made available to Federal agencies involved in economic and social assistance programs, and for shipment to offices of various contractors who received excess property in connection with their contracts or grants. Items not disposed of by these means usually were offered for sale.

Printed Materials

The bulk of the printing of forms, manuals, and training guides for the 1970 census field work was done by the U.S. Department of Commerce. This was accomplished on a flow basis over a period of about 14 months beginning in October 1968 and continuing through November 1969. Relatively few items were developed and printed for field use after November 1969.

Most of the printed forms, manuals, and training guides and training aids were accumulated at the Bureau's Jeffersonville facility where they later were assembled into supply and training kits.

Many of the field-use forms could not be developed until late decisions were made on questionnaire content, sample size (20 or 25 percent), pay rates, etc.; therefore, more manuals and training guides had to be printed later and over a much shorter time period than had been planned.

Several of the forms were specialty-type, i.e., carbon-interleaved sets, NCR (no carbon required) sets, continuous pin-fed forms for high-speed printers, combined appointment forms and folders, wire-bound books, operations calendars, etc. Some of these forms required 3 to 5 months for delivery.

A summary of printing for 1970 census field-use forms follows:

	No. of forms used	Quantity range	Total No. of copies printed
1. Administrative series forms.....	70	500 to 1,036,000	6,835,000
2. "D" Series forms (district office records and miscellaneous forms, D-100 through D-363).....	372	300 to 18,313,000	47,307,000
3. Manuals (D-500 through D-546.3).....	[1]53	400 to 255,000	1,013,000
4. Training guides (D-600 through D-669).	[2]56	300 to 9,300	52,900
5. Training aids (workbooks, home study guides, exercises, etc.).....	274	200 to 145,000	3,325,000

[1]Manuals averaged about 72 pages each for a total of 3,832 pages.
[2]Training guides averaged about 252 pages each for a total of 14,240 pages. Two guides were not printed; photocopies were used to conduct training.

PROCESSING SUPPLIES AND EQUIPMENT

In May 1970, a small supply section was established at the Bureau's Jeffersonville facility to provide the expanding operations there with needed materials and services. At first the requests were so varied, and the space for supplies so limited, that meeting the demands for the various operations could not always be anticipated far enough in advance to maintain sufficient supplies. This condition improved with the allocation of more space, the delivery of additional supply cabinets, and the addition of open shelving. At the peak of census processing activity, the supply area contained 450 square feet of floorspace.

Rubber stamps, preprinted pressure-sensitive labels, publications used for reference in coding, reference binders, special-size cartons, and many other items that were not obtainable through regular Bureau supply channels, required special purchase. Orders for reproducing various printed items, from labels to carbonless paper forms in quantities of 5,000 or less, and requests for punchcards, computer paper, and all preprinted materials already in stock, were processed through the supply section.

It was necessary to provide the census operations staff with furniture, partitions, office machines, identifying signs, fire prevention and safety equipment, electric fans, parking spaces, bulletin boards, and telephones. Metal desks and chairs, which were in short supply, were issued only to certain supervisors and other administrative and technical personnel; cardboard tables and old chairs of all kinds were used by the clerks. Some electric adding machines and calculators were rented to augment the Bureau's inventory.

The returned questionnaires would require expeditious handling. With the assistance of GSA, the Census Bureau developed specifications late in 1969 for steel bins and matching dollies for carrying and storing the 1970 census questionnaires through the microfilming and coding processes. Each bin was designed to hold about 20,000 short questionnaires, packed in cartons by enumeration district. This was the approximate workload for one camera during one microfilm shift and constituted a weight load of about 1,200 pounds.

The Census Bureau purchased 2,500 of these bins and 1,500 dollies. The bins were received from the manufacturer in shipments spread between May and September 1970. The initial shipment was late, and nearly half of all the bins required repair because they were found to be damaged on arrival. As receiving and processing operations were mounting, smaller and lighter-weight bins originally purchased for the 1950 and 1960 censuses had to be used. When loaded in the older bins, the cartons of 1970 questionnaires protruded from the sides and frequently were damaged in transit or were broken under their own unsupported weight. When bins were not available, incoming shipments were placed on pallets for temporary storage. This situation not only made double handling necessary, but also tied up needed warehouse floorspace. The ratio of dollies to bins was also found to be too low, as bins which needed to be moved often could not be because dollies were not available.

SPACE, COMMUNICATIONS, AND SERVICES

Field Offices

Space.--In the fall of 1968 the Public Building Service of the GSA (General Services Administration) conducted

a survey which indicated that there would be little Government-owned or rent-free space available for use by the 393 temporary census field offices in 1970. In May 1969 GSA issued an Occupancy Guide which had been developed jointly by the Public Building Service and the Census Bureau. This guide provided information about space use and layout for the various district offices, and was to be used in conjunction with Bureau instructions issued in November 1967 which described the step-by-step process for acquiring space. GSA was the sole leasing authority in 286 urban centers in the United States, and virtually all space in those centers and elsewhere was obtained through this agency.

General requirements for each district office were as follows:

1. All space preferably was to be on the same floor.

2. Elevator service would be needed if space was not on the street floor.

3. Larger offices were to have loading facilities to expedite handling of mail deliveries and freight shipments.

4. Normal office utilities and services such as heat, water, electricity, and toilet facilities were required; air conditioning was desirable.

5. Open office space, with one or two private offices, was preferred.

6. Most space was required for an average of 5 to 6 months.

Between the summer of 1969 and early February 1970, Census Bureau officials located space for the 393 district offices as follows: 181 sites for offices in which the "conventional" data-collection procedure was to be used, each with between 2,500 and 3,000 square feet of floorspace; 167 for "decentralized" offices with 5,000 to 5,200 square feet of floorspace each; and 45 for "centralized" offices, each with 10,000 to 12,000 square feet of floorspace. In several of the major metropolitan centers, available space was at a premium. In order to meet deadlines for opening offices, it was necessary in some instances to accept facilities which did not meet all requirements or to obtain exceptions from such GSA limitations as the $5.00 per-square-foot ceiling on rentals. In some areas such long delays were experienced in the execution of leases that the property offers were withdrawn and the Bureau was forced to seek alternate locations.

In all, the Census Bureau was able to obtain district office space rent-free in public buildings in 50 cities, and at commercial rates averaging $3.95 per square foot per annum for the remaining 343 locations in the United States.

The total rental cost for this space was approximately $3,016,000, with an estimated $335,000 spent in addition for contractual work to improve the rented space. Most offices were open for about 5 to 6 months, as expected. Additional space was rented to accommodate expanded regional office activities during the data-collection period, at a cost of $141,000. (Space for the seven census offices in Puerto Rico was obtained through GSA. Four of the offices were located in Government buildings and three were in commercial space. The cost of the latter averaged $2.91 per square foot per annum for a total of approximately $7,000.)

The space acquisition system was generally efficient, and facilities were obtained for all district offices in time for their openings in January and February 1970.

Telecommunications.--In June 1968 officials of the Bureau of the Census and of the Department of Commerce met with GSA representatives to discuss requirements for data transmission during the 1970 census. As a result of this meeting, a detailed plan was prepared in early 1969 which involved the transmission of census cost and progress information from the Bureau's regional offices (now called data collection centers) to Bureau headquarters in Suitland, Md., in a form compatible with or convertible to the capabilities of the Bureau's existing computer equipment. This plan was carried out as follows: The Bureau utilized GSA's Advance Record System, which is basically a Government teletype system used throughout the United States. Through the use of additional ASR (automatic send receive) terminals in Suitland and at each regional office, the regional offices transmitted cost and progress messages during the months their respective district offices were open. Transmissions occurred each Wednesday no later than 2:30 P.M., regional office time. Tapewinding attachments were placed on the ASR machines used for this purpose in Suitland. These attachments allowed preparation of the tapes for processing through a machine which converted the data on paper tape (on which they were received) to magnetic tape suitable for the Bureau's computer equipment.

District offices submitted field counts of population and housing units directly to Suitland via commercial telegraph.

In the summer of 1969 the Bureau determined its requirements for the telephone service needed in regional and district offices during the census. Arrangements for FTS (Federal Telecommunications System) intercity voice network facilities for telephone communication among headquarters, the regional offices, and the district offices were made by GSA, while the Bureau ordered local commercial telephone facilities directly from the local telephone companies.

The orders for commercial service included extra lines for telephone assistance centers for the public in certain metropolitan areas. These centers were used by respondents who needed help in completing census questionnaires. Working with telephone company representatives in Washington, D.C., the Bureau located the telephone assistance operation at one district office within each metropolitan area which could serve the greatest number of persons by local calls only. Special telephone numbers were assigned to the assistance centers; these numbers were given out to the public by the telephone companies' local directory-assistance operators.

The particular installation and disconnection dates for commercial telephone service for each temporary census office were determined by the Bureau's regional and district offices working individually with the local telephone companies. (For details of district office telephone requirements see chapter 5, "The Field Enumeration.")

The magnitude of the telephone usage in the Bureau's 12 regional offices, one area office, and 393 district offices in the United States is expressed by the following figures (rounded):

Number of local commercial telephone calls charged to district offices (by type of data-collection procedure)

Total	2,699,200
Conventional	848,800
Decentralized	1,202,400
Centralized	648,000

Number of long distance commercial telephone calls made by crew leaders to district offices (by type of data-collection procedure)

Total	202,500
Conventional	148,500
Decentralized	54,000
Centralized	none[1]

Number of FTS (Federal Telecommunications System) calls from regional offices to district offices (by type of data-collection procedure)

Total	108,900
Conventional	32,580
Decentralized	60,120
Centralized	16,200

It was estimated that an equal number of FTS calls were made from the conventional and decentralized district offices to the regional offices, but that centralized district offices initiated about one and a half times as many calls to the regional offices as were received. It also was estimated that during the census data-collection period about 5,400 FTS calls were made from Suitland to the 12 regional offices.

Census Operations Facilities

Space.--The decision to prepare field materials for the 1970 Census of Population and Housing and to process the resultant data concurrently with the same operations for the 1969 Census of Agriculture, while continuing with current projects, made it necessary to evaluate the condition and adequacy of the Bureau's existing operations facilities at Jeffersonville, Ind. The amount of space for current operational requirements was determined first. For example, 150,000 square feet of space (allowing for aisles and proper grouping of components) would be needed in early 1969 for storage, assembly, and staging of field materials for the 1970 census. It also was necessary to reserve space for storage of records, publications, vehicles, and other related equipment. The total space available in Jeffersonville for all operations was 650,000 square feet; later an additional 65,000 square feet was obtained from GSA and 20,000 square feet were leased commercially. Federally owned or controlled buildings in Jeffersonville were maintained by GSA at the following rates per square foot: $0.77 in FY (fiscal year) 1969, $1.00 in FY 1970, and $1.40 in FY 1971. During peak census processing activities, over 710,000 square feet were occupied. To allow maximum use of this space, excess materials on hand were disposed of, files were consolidated, and certain records were transferred to archives.

Space modification.--In March 1968 the Census Bureau advised GSA of the kinds and sizes of working spaces needed for the various operations at Jeffersonville. Beginning in early June 1968 Bureau staff members and regional representatives of GSA held a series of meetings to determine the modifications necessary, and contracts were awarded for three consecutive phases of construction. These phases were as follows:

Phase I, which began in 1969, consisted of upgrading bays of warehouse space to make them suitable for use by clerical operations, and of constructing a bridge between two buildings to facilitate movement of census materials.

Phase II consisted of upgrading other warehouse space to provide areas for the assembly and distribution of 1970 census materials and for the receipt and storage of questionnaires returned from the field.

Phase III provided for additional heating and lighting in one building, for completion of clerical space in another, and for space and adequate electric power for 40 automatic page-turning microfilm cameras and for on-site processing of the microfilm.

In January 1970 it was determined that the planned space for clerical processing would be insufficient, and upgrading of two more warehouse bays, together with increasing the number of restrooms, was contracted for at a cost of $100,000. Also included in the basic remodeling program was the air conditioning of five bays in one building (including the camera area) at a total cost of approximately $125,000.

The more complicated construction, placed in the hands of private contractors, was completed on time. A number of the smaller, less complicated projects, carried out by GSA personnel, such as erection of partitions and installation of drinking fountains, were still underway when census processing operations began. Wherever possible, "temporary" type methods and materials were used, so that the entire modification program was accomplished for slightly less than $1 million, as compared with original estimates of $1.6 million for more permanent remodeling. (Of the $1 million cost, approximately $300,000 was funded from the 1969 Census of Agriculture.)

With few exceptions, however, all electrical equipment had to be plugged into drop cords that were suspended from outlets near the ceiling. In some bays there were no available outlets, so the lights were unplugged and drop-cords were plugged into these outlets. During very hot weather, the excessive load on the electrical system caused occasional power failures.

Telecommunications.--In late 1969 the existing 200-station switchboard-operated telephone system was replaced with a new one with a capacity of 600 stations. This new system, which encompassed other Government organizations using the Jeffersonville facility as

[1]Centralized offices were mainly in "inner city" areas, so that all telephone contact between crew leaders and the district offices was by means of local calls.

well, allowed direct dialing into and out of each extension without going through a switchboard operator. At the peak of the 1970 census approximately 325 telephones and 20 FTS (Federal Telecommunication System) access lines were used for census purposes alone.

Other services.--Parking had to be provided for approximately 2,500 employees above the normal work force. To accomplish this, a lease was negotiated for a period of approximately 2 years for six acres of land adjacent to the Jeffersonville facility. All improvements, which included gates, grading and gravel surfacing, were paid for by the Bureau of the Census.

In 1968 a library service was installed to collect reference materials (such as address coding guides, ZIP code, and commercial directories) and to control the issuance of these materials, which were needed in coding and other processing activities at Jeffersonville. A full-time librarian ultimately was employed. Over 5,000 volumes were acquired over a 2-year period. In addition, some telephone directories were received from the district offices in their closing shipments, but not in sufficient numbers for coders to use. In December 1970, therefore, the Bureau obtained additional directories from a private firm.

Vending machines were installed and serviced by a private contractor; a major service center was located in one building and satellite service centers were installed in other buildings. A messenger service was established for the internal movement of memorandums and reports, and a messenger-driver was assigned to transport packages and, where needed, persons (for example, from distant buildings to the nurse's station). Those duties which required typing of large numbers of reports, rosters, address lists, etc., were performed in a typing pool. A staff of 10 operators on two shifts manned five mass-production photocopy machines at the height of processing operations. In addition, several smaller machines were maintained for smaller reproduction jobs.

ASSEMBLY AND SHIPMENT OF FIELD MATERIALS

Assembly

Intensive planning and preparation for the assembly (and subsequent storage and staging) of supplies for the field training and enumeration began in Jeffersonville immediately after completion of the 1968 dress rehearsal censuses. With approximately 800,000 kits of material of various kinds needed for the 1970 census, there were about 3 1/2 times as many kits to be prepared as for the 1960 census. In 1960 all of the enumerator's supplies were contained in the enumerator's portfolio; in 1970 the portfolio was smaller and would not hold all the supplies needed for an assignment. Therefore each 1970 portfolio contained supplies for 2 or 3 days' work; these were supplemented by a supply kit of questionnaires, and an additional reserve kit was given to each crew leader. An individual training kit was prepared for each trainee and instructor for virtually every type of training in 1970. This differed from 1960, when one training kit was prepared for the crew leader or instructor, who distributed individual items in the kit to the trainees during the training session.

Very little capital equipment was purchased for the kit assembly work; the only major items required were one imprinting machine, used to print the addresses of district offices on some of the questionnaire mailing packages, and three binding machines for binding field reference material. Using labeling machines already on hand, assemblers glued approximately 600,000 enevelopes to the cardboard covers and backs of address registers. All collating was done by hand. The largest project of this type was for 82,800 training kits for certain enumerators; this required hand-collation of 15 practice questionnaires for each kit.

A manual, ledger-type control system was set up in July 1969 to record material receipts, issues, and inventory and assembly statistics. It soon was learned that this type of manual control was not adequate; the kit assembly operation was complex, and more rapid monitoring of late or incomplete receipts of supplies was necessary. A punchcard system was designed and implemented to maintain records and furnish assembly and supply statistics. Four weekly reports provided current information as to the progress and/or delays in the assembly operations. There were incidents when assembly had to be halted or kits not shipped because one or more of the components of a kit had not arrived. The reports also indicated any discrepancies between quantities of materials specified and the quantities ordered or received.

A typical assembly operation was staffed by one or more supervisors and assistants, together with two stock suppliers, eight on-line assemblers, and two packers for each assembly line. One person usually supervised two or three assembly lines at the same time, unless the project was particularly complex; when this was the case an assistant supervisor was assigned to each line.

Following receipt of the specifications for a kit, control cards were prepared for the assembly operation and a check was made to see whether all components were available. A dummy kit was prepared to determine the proper outer package and the most expeditious way of packing it. Unless a particular type of package had been specified, one standard-size carton was used; this carton sufficed for 60 to 70 percent of the shipments. It was imprinted "Kit No.___" on one line and "___ each" on a second line, and the necessary information was overprinted or added by hand. While most cartons were sealed with ordinary brown kraft tape, certain cartons were sealed with green kraft tape to indicate that the materials in them would be needed early in the district office operations.

When it was determined that all components were available, a starting date was established, the kit assembly project was assigned to a supervisor, and arrangements were made to have material delivered to the assembly line location. This required close scheduling to take advantage of available personnel and equipment.

A QC (quality control) point was established for each kit assembly project. This check was conducted by assembly personnel on a rotating basis. The QC checkpoint usually was near the end of the assembly line to allow checking just before each kit was sealed. The QC check varied with each kit, but generally consisted of 100-percent verification of the first 100 kits and

complete examination of every tenth kit thereafter. Computer-generated address registers (Forms D-166 and D-213) were reviewed on a 100-percent basis for proper assembly.

Kit assembly began in July 1969 and continued through February 1970. Kits for supplemental shipments were prepared as necessary until all district offices were closed in the summer of 1970. The assembly operation reached its peak between October and December 1969, when 196 employees were engaged in all phases of the work.

Bureau personnel also packaged approximately 31 million Form D-14 Advance Census Questionnaires into units of 50, 100, and 250 questionnaires for distribution to post offices. The principal assembly projects were as follows:

Item	Number of units
Supply kits, total (for details, see appendix A)	419,215
District offices	402,824
Regional and area offices	65
Self-enumerating places	2,904
Puerto Rico	13,422
Training kits, total	372,069
District offices (for details, see chapter 5)	363,269
Puerto Rico (for details, see chapter 9)	8,800

Note: An extra supply of training kits--about 15 percent--was prepared initially to provide for the replacement of crew leaders, enumerators and office clerks, except for enumerators in centralized offices for whom a 25-percent reserve was established. The number of reserve training kits prepared was fairly close to the number needed, except that a 35-percent reserve was needed ultimately for centralized office enumerators.

Address registers, total		300,752
Conventional	Form D-130	140,267
Mail areas--		
Hand listed	Form D-167	56,848
Computer-generated	Form D-166	73,530
Computer-generated	Form D-213	22,200
Blank		2,040
Puerto Rico	Form D-130PR	5,867
Mailing packages for military installations, total		355,251
	Form D-6	273,000
	Form D-7	60,944
	Form D-8	21,307
Books (other than address registers), spiral-bound, for reference use		55,270
District offices		52,084
Puerto Rico		3,186

Initial Shipments to Field Offices

One of the major decennial projects was the shipment of over 8 million pounds of materials from the GSA supply depots and the Bureau's Jeffersonville facility to the 393 district offices throughout the United States and the seven offices in Puerto Rico. These shipments consisted of census questionnaires, training and enumeration kits, office supplies, and similar material. Most materials were prepared or received at Jeffersonville during 1969, and in December of that year the initial staging of the material for district offices began. Staging consisted of bringing together in a specific warehouse area all the material for a certain number of district offices (the amount to be loaded within the next day or so) and then stamping the appropriate 4-digit district office code on each package or bundle for each office.

District offices opened on three different dates (January 19 and 26, and February 9) over a 4-week period, which allowed a reasonable time for the loading of 263 trailer loads in the initial shipments from Jeffersonville for the 393 district offices.

The actual shipping of materials started the week of January 4, 1970, principally to the 50 decentralized offices engaged in prelisting in the spring of 1970 (prior to Census Day), and the first shipment left Jeffersonville at the end of that week. Shipments to the 181 conventional district offices began on January 14 and continued through January 25 (or the day before offices were to open). Materials for some of the Kentucky, Indiana, and West Virginia offices were shipped on January 25. The shipments to the 45 centralized offices and to the remaining 117 decentralized offices began on January 27 and continued through February 6, 1970.

Twelve forklift trucks were rented to augment the five already owned, and a sufficient number of drivers were hired to operate them on several shifts. To assist the Bureau of the Census in the shipping operations, a GSA traffic specialist was detailed to coordinate shipments with the various commercial trucking firms. The shipping contracts and agreements previously made by GSA were reviewed to ensure that contracts were adhered to in meeting shipping schedules.

In order to take advantage of truckload tariff rates, the materials for several district offices frequently were loaded on the same truck. This required close coordination of shipment size, routing, and shipping dates. However, when the district office supplies shipped the first week arrived at their destinations, it was discovered that the district office code number had not been stamped on each package as instructed. This created problems when loads for two or more offices on the same trailer were shifted in transit. Kraft wrapping paper was the only divider between the materials for different district offices. The presence of unstamped packages caused even greater problems when the materials had to be stored or transferred to another vehicle while en route. If shortages were reported it was necessary to check with the offices whose shipments were loaded on the same trailer to see if any had an oversupply of the missing items. If not, the items had to be reordered from Jeffersonville.

Supplemental Shipments to Field Offices

Only a small portion of the 5.3 million unaddressed mailing packages that would have to be addressed locally in the district offices was delivered to Jeffersonville for inclusion in the initial shipments. (Most of the balance was shipped directly to the district offices from the

mailing-piece assembly contractor's plant in late February.) Several other items were not ready in time for the initial shipments; these included the computer-generated address registers needed in all the mail census offices, enumeration district and tract-and-block directories needed to code new addresses, some of the control records, and maps for several of the district offices. Except where a trailer could be loaded for several district offices in one delivery area, most late items were shipped by air freight. These air freight shipments (including unaddressed mailing packages) weighed about 780,000 pounds and entailed expenditure of over $90,000 which was not anticipated in the budget. (The budget was based on the premise that all materials would be in Jeffersonville in time to be shipped by the least expensive method--initial shipments in trailer-load lots.)

Filling Requests from Field Offices and Self-Enumerating Places

During the 1970 census the Bureau's Jeffersonville facility filled about 6,800 requests for supplies. About 700 requests were received from self-enumerating places such as military bases or Government hospitals and about 6,100 from the field offices. About 90 percent of the requests from the field offices were received by telephone and 10 percent on Form BC-22, "Request for Supplies."

The ease in ordering via the FTS (Federal Telecommunication System) probably accounted for the substantial volume of requests. Some offices made two or three separate requests on the same day. A summary of the requests for supplies by type of district office follows:

1. Conventional district offices average 12 requests per office for an average of 1.8 items per request. Several conventional offices made only one or two requests while several others made 25 to 30 requests.

2. Decentralized district offices averaged 16 requests per office for an average of 2.0 items per request. Several decentralized offices made one to six requests while others made 35 to 40 requests.

3. Centralized district offices averaged 21 requests per district office for an average of 2.4 items per request. Several centralized offices made four to seven requests while others made 35 to 43 requests.

4. Regional offices averaged 35 requests per office for an average of 1.5 items per request. The number of requests by regional offices ranged from 13 to 96.

5. About 15 percent of the self-enumerating places requested more questionnaires.

By mid-March 1970 the field offices had complained of numerous delays in the receipt of supplies ordered. The backlog of requests became so large that on March 23 a "1," "2," or "3" priority was assigned to each telephone request as it was received. Many complaints of delays were still received. Analysis of requests from a sample of six district offices (covering the period of February 12 to April 10, 1970) showed more turnaround time in Jeffersonville than had been expected; the percentages of orders received and shipped the same day or ensuing days were as follows:

Same day	- 9%
1st day	- 31%
2nd day	- 12%
3rd day	- 12%
4th day	- 12%
5th day	- 10%
6th day	- 5%
7th day	- 7%
More than 7 days	- 2%

The postal strike in March 1970 caused further delays in shipments to many field offices. Those offices in the Northeast, particularly in and around New York City, were affected most. Delays in receipt of supplies caused the reordering of many items, but most duplicate orders were detected and stopped. A study of the requests for a 10-percent sample of district offices did not reveal any particular pattern or clues as to how the number of requests could have been substantially reduced while furnishing a prudent reserve of each item.

The major part of the supply and logistics program for the field offices went very well. The most serious logistic problems were the late receipt of mailing pieces and address registers for field office requirements.

The return of completed census questionnaires and other materials to Jeffersonville began in May 1970 and continued on a flow basis until September of the same year. Jeffersonville received back 425 truckloads, with a total gross weight of 6.1 million pounds. All the materials that were returned were sent collect, and commercial bills of lading were converted to Government bills of lading at Jeffersonville. (The handling of the incoming shipments, i.e., receipt and check-in, is described in chapter 8, "Processing.")

FORMS DESIGN

Scope

Between 1961 and 1967 the Bureau conducted a number of experimental projects and pretests in which questionnaire wording and format, mail census techniques, and various other procedures were developed for the 1970 census. Approximately 700 different questionnaires, field and administrative forms for the Bureau of the Census and for those operations involving the Post Office, address registers, handbooks, and manuals were designed for these experiments. Included was some experimentation with type styles and sizes, paper and ink colors, as well as with the formats in which the various items would be printed. Approximately 725 items were prepared for the three dress rehearsals of the 1970 census (Dane County (Madison SMSA), Wis., Sumter and Chesterfield Counties, S.C., and Trenton, N.J.) conducted in 1968. For these an "Internal Forms Design and Printing Task Force," composed of representatives of several Bureau divisions, established time schedules and progress reporting methods for designing and printing, and operating procedures for requesting forms design services; and determined other related

issues. (These methods and procedures, and the experience gained, were carried over to the 1970 census itself.) A forms-numbering system was established, as follows:

Public-use, field-use, Post Office use, evaluation forms, and related materials. The letter "D" (for "Decennial") was used as a prefix to the assigned number. The forms were divided into six categories and a block of numbers was assigned to each category within the range 1 to 899; e.g., 1-99, Public Use; 100-499, Field Use, etc. In the dress rehearsals these numbers were followed by a suffix "X" (experimental).

Processing and internal use forms. A prefix "70" (for 1970), the code number of the responsible division, and a sequential form number was assigned, e.g., 70-34-1. Where necessary, a letter suffix was added in parentheses after the final digit; e.g., 70-34-2(L).

Because of procedural and other changes, less than 10 of the dress rehearsal forms could be used in 1970 without modification. The three types of data-collection procedures--conventional, decentralized, and centralized--required certain variations in the forms used. Some forms were specialty-type, such as carbon interleaved sets or NCR (no carbon required) sets, pin-fed forms for computer printout, personnel folders, and wire-bound books. Such items as operations calendars, time schedules, production schedules, visual aids, questionnaires, envelopes, and instruction sheets required careful design and composition. In all, 1,035 separate forms were designed for the 1970 Census of Population and Housing and its related programs. These may be summarized as follows:

Type of operation or place of use		Number of forms
Total	-	1,035
Post Office	-	21
Field operations	-	342
Geography	-	98
Public use	-	42
Internal use		
Processing	-	185
Other	-	96
Components of Change and Residential Finance	-	80
Puerto Rico and Outlying Areas	-	175

Sixty-seven of the forms and questionnaires for Puerto Rico were prepared in Spanish. The short household questionnaire used in the United States and an information copy of all the U.S. household questionnaires were translated into Spanish and Chinese. The Spanish versions were designed in the Bureau; the Chinese counterparts were designed and printed commercially.

Design of geographic forms began early in 1967, and design for the other decennial census needs was carried out between September 1968 and April 1970. Except where there were late decisions on questionnaire content or on policy, there were few delays encountered in forms design. Forms technicians worked closely with the responsible divisions. After review and approval, five reproducible copies of each form were made before the master copy was sent for printing. Four of these copies were used for exhibits in manuals and training guides, and one copy was kept in reserve in case the reproduction master was lost or mutilated. The final version of any form was held for 5 days before being released for printing, in case a last-minute procedural change might require alteration of the form.

The technical services necessary to prepare these forms, after the content was provided by the subject-matter divisions, cost approximately $26,000.

Changes in the 1970 Household Questionnaires

Building on the experience gained through 1968, a number of changes were made in the household questionnaires approved for 1970 from those used in the latest pretests and dress rehearsals. The cover and flap of the latter (see fig. A for example) were altered radically: Coverage item A (number of units at address) was moved from the cover to the beginning of the housing items in the body of the 1970 questionnaire; item B was deleted as a labelled question and was incorporated in the flap instructions. (The 1970 questionnaire cover and flap are illustrated in fig. B.) Minor changes were made in the headings of the sample population pages, and in the wording, skip instructions, and format of a number of the questions. For example, in questionnaire item 9 (additional persons), "Yes" and "No" FOSDIC circles were added for the respondent to complete; in the dress rehearsals this item required an answer only if there were more persons in the household than listed in the questionnaire. Item H25(fuel) was revised in format and was divided into three distinct parts, a, b, and c, to distinguish more clearly among house heating, cooking, and water heating fuels. Thirteen other questions were modified in various ways. (For the development of the 1970 census questionnaire items, and comparison with those used in prior decennial censuses, see chapter 15.)

ENVELOPES AND QUESTIONNAIRES

Envelopes

In September 1968 the Census Bureau began negotiating through the General Services Administration for the procurement of approximately 89 million envelopes needed for the questionnaires to be mailed out and mailed back.

The envelopes, in which the questionnaires were to be mailed out, Forms D-6, D-7, and D-8 (see fig. C) were 5-1/4" x 12" in size, printed in blue ink on white 28 lb. stock, with an open window on the front and the back of each envelope. The return envelopes, Form D-9 (see fig. C), were 5-1/16" x 11-3/8", and printed in black ink on light colored 24 lb. sulphate paper. The return envelope had one window on the front, and there were perforations angling from the upper and lower left corners of the window to the left corners of the envelope. (These perforations allowed the rapid opening of the envelopes by district office personnel engaged in receiving the returned census questionnaires.) No window placement could exceed a tolerance of plus or minus 1/16 inch. In addition, most of the return envelopes were imprinted with the delivery addresses of 212 different census field offices.

Figure A. A 5-Percent Sample Household Questionnaire for Dress Rehearsals in 1968

Special Census of Trenton, New Jersey

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
WASHINGTON, D.C. 20233

DEAR FELLOW CITIZEN:

Wednesday, September 18, is Official Census Day. Please fill out this form and mail it on September 18, or as soon afterward as possible. We must call on you for the information if you do not return your completed form to us.

Your cooperation in carefully filling out the form and mailing it back on Wednesday, September 18, will help make the census successful, and save the government the expense of calling on you for the information. Estimates may be made where exact answers are not known.

Answers to the census questions are required by law (Title 13, U.S. Code). By the same law, the information you furnish is CONFIDENTIAL. It may be seen only by sworn census employees and may be used only for statistical purposes.

The householder should make sure that the information is shown for everyone here, as explained in the form. If a boarder, roomer, or anyone else prefers not to give the householder all his information to enter on the form, the householder should write at least his name, relationship, and sex in columns 1 to 3. A Census Taker will call to get the rest of the information directly from the person.

Thank you for your cooperation.

Sincerely yours,

A. Ross Eckler

A. Ross Eckler
Director
Bureau of the Census

UNITED STATES CENSUS

	a1.	a2.	a3.	a4.	a5.

If the address shown above has the wrong apartment identification, please write the correct apartment number or location here:

A FEW GUIDES

- Please examine the enclosed pink instruction booklet.
- Black pencil is better to use in filling your census form than ball point or other pens. This form will be read directly by an electronic computer. Black pencil marks are read most accurately.
- Fill circles " o " like this: ●
- If you fill the wrong circle, please erase the mark completely.
- For write-in answers, please print or write clearly.
- If you want help in filling this form, please call the Census office. You can get the number from telephone "Information."

Please fill in

A. *We want to be sure that each and every house, apartment, or flat at this address gets a Census form.*

How many living quarters, occupied and vacant, are at this address?

- o One
- o 2 apartments or living quarters
- o 3 apartments or living quarters
- o 4 apartments or living quarters
- o 5 apartments or living quarters
- o 6 apartments or living quarters
- o 7 apartments or living quarters
- o 8 apartments or living quarters
- o 9 apartments or living quarters
- o 10 or more apartments or living quarters
- o A mobile home or trailer

PLEASE TURN THIS FLAP IN BEFORE FOLDING THE FORM

After filling question A, please read the instructions and question B on this flap. Then continue with column 1 on the inside of the form.

★ ★ ★

In column 1 of the inside page, please list everyone who was living here on Wednesday, September 18, 1968. Also list anyone staying or visiting here who had no other home.

Include:

All family members and other relatives living here, including babies.

All lodgers, boarders, servants, hired hands, and other nonrelatives living here.

All persons who usually live here but are temporarily away.

All persons with a home elsewhere but who stay here most of the week while working or attending college.

Do Not Include:

Any college student away from here at school (or who is here only on vacation).

Any person away from here in the Armed Forces or in an institution such as a nursing home, mental hospital, or sanitarium.

Any person visiting here who has a usual home elsewhere.

★ ★ ★

B. If everyone in this home, apartment, or unit is only staying here temporarily and has a usual home elsewhere, please fill this circle o and print their names below. Make no other entries on this form.

_____

_____

_____

_____

Figure B. Front Cover and Flap of the Short Household Questionnaire for Mail Areas

MAIL-OUT/MAIL-BACK ENUMERATION

D-1. Short Questionnaire

(front cover)

Page 1

UNITED STATES CENSUS

This is your Official Census Form

Please fill it out and mail it back on Census Day, Wednesday, April 1, 1970

	a1.	a2.	a3.	a4.	a5.

If the address shown above has the wrong apartment identification, please write the correct apartment number or location here:

How To Fill This Form

1. **Use a black pencil to answer the questions.**

   This form is read by an electronic computer. Black pencil is better to use than ballpoint or other pens.

   Fill circles "○" like this: ●

   The electronic computer reads every circle you fill. If you fill the wrong circle, erase the mark completely, then fill the right circle.

   When you write an answer, print or write clearly.

2. **See the filled-in example on the yellow instruction sheet.**

   This example shows how to fill circles and write in answers. If you are not sure of an answer, give the best answer you can.

   If you have a problem, look in the instruction sheet.

   All instructions are numbered the same as the questions on the Census form.

   If you need more help, call the Census office.

   You can get the number of the local office from telephone "Information" or "Directory assistance."

3. **Your answers are CONFIDENTIAL. The law (Title 13, United States Code) requires that you answer the questions to the best of your knowledge.**

   Your answers will be used only for statistical purposes and cannot, by law, be disclosed to any person outside the Census Bureau for any reason whatsoever.

   The householder should make sure that the information is shown for everyone here.

   If a boarder or roomer or anyone else prefers not to give the householder all his information to enter on the form, the householder should give at least his name, relationship, and sex in questions 1 to 3, then mail back the form. A Census Taker will call to get the rest of the information directly from the person.

4. **Check your answers. Then, mail back this form on Wednesday, April 1, or as soon afterward as you can. Use the enclosed envelope; no stamp is needed.**

   Your cooperation in carefully filling out the form and mailing it back will help make the census successful. It will save the government the expense of calling on you for the information.

PLEASE CONTINUE

U.S. Department of Commerce
Bureau of the Census
Form D-1

Budget Bureau No. 41-S68107
Approval Expires December 31, 1970

MAIL-OUT/MAIL-BACK ENUMERATION

D-1. Short Questionnaire--Continued

(flap)

5. **Answer the questions in this order:**

   Questions on page 2 about the people in your household.

   Questions on page 3 about your house or apartment.

6. ***In Question 1 on page 2,* please list each person who was living here on Wednesday, April 1, 1970, or who was staying or visiting here and had no other home.**

LIST IN QUESTION 1	DO NOT LIST IN QUESTION 1
Family members living here, including babies still in the hospital	Any person away from here in the Armed Forces
Relatives living here	Any college student who stays somewhere else while attending college
Lodgers or boarders living here	Any person who usually stays somewhere else most of the week while working there
Servants or hired hands living here	Any person away from here in an institution such as a home for the aged or mental hospital
Other persons living here	Any person staying or visiting here who has a usual home elsewhere
College students who stay here while attending college, even if their parents live elsewhere	Note: If <u>everyone</u> here is staying only temporarily and has a usual home elsewhere, please fill this circle ➔ ○ and give their names on page 4 in the space for question 12. Do not answer any other questions. Mail back the form on Wednesday, April 1.
Persons who usually live here but are temporarily away (including children in boarding school below the college level)	
Persons with a home elsewhere but who stay here most of the week while working	

PLEASE TURN THIS FLAP IN BEFORE FOLDING THE FORM

Figure C. D-6-D-9. Mailing Envelopes

(D-6 used for short form D-1, D-7 used for long form D-2, D-8 used for long form D-3, and D-9 return envelope addressed to the appropriate district office)

By law (Title 13, U.S. Code), the information you furnish on the Census form is CONFIDENTIAL

BUREAU OF THE CENSUS
WASHINGTON, D. C. 20233

OFFICIAL BUSINESS
D-6

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS
WASHINGTON, D. C. 20233

OFFICIAL BUSINESS
D-7

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS
WASHINGTON, D. C. 20233

OFFICIAL BUSINESS
D-8

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE

CENSUS '70 APRIL 1

■ This envelope contains your Official Census Form. ■ Please fill it out and mail it back on Wednesday, April 1, 1970.

To: U.S. Census Office
St. Petersburg, Fla. 33730

Envelopes were packed 1,000 each in full-telescoping, 275 lb. test fibreboard shipping containers, so that the containers could be reused for the completed census mailing pieces after assembly. The cartons were packed six by six to a pallet and stacked two pallets high to conform with standard truckload dimensions.

After receiving bids, two contracts were awarded in March 1969. One envelope manufacturer contracted to provide 45 million mail-out envelopes at $6.87 per thousand. and another 44.4 million return envelopes at $5.24 per thousand, delivered to the contractor assembling the census mailing pieces. Delivery was to begin in May 1969. In September 1969, when the Bureau was able to determine its needs more closely on the basis of actual counts of addresses on tape and field reports, additional envelopes were ordered; the prices for these were higher than those covered by the original bids. The envelope purchases were as follows:

Form No.	Quantity purchased	Delivered
D-6	38,100,000	Approx. 5 million per month
D-7	7,200,000	Approx. 1 million per month
D-8	2,400,000	Approx. 275,000 per month
D-9	47,100,000	Approx. 3 million per week

(Approximately 4.7 million of the D-9 envelopes were ordered with no district office address. These envelopes were inserted in mailing pieces, and the addresses were imprinted through the rear window of the mail-out envelope as needed.)

The customization of return envelopes for the various district offices caused a problem throughout the production and assembly operations. From the time the envelopes were procured, difficulties were encountered in estimating the number of envelopes to be ordered with each unique address, in controlling the delivery of each type to the assembly plant, and in the warehousing of the 212 variants (actually 213, counting the blanks). (Even after the envelopes were stuffed into the mailing pieces the control problem continued, since the mailing pieces then varied by questionnaire type as well as by district office return address. After the mailing pieces were labelled, quality control checks had to be made to verify the consistency between the outgoing address labels and the return envelope addresses.)

The mailing piece assembler rejected curled, bent, or warped envelope stock, blocks of envelopes that were sealed or stuck together, or cartons of envelopes that otherwise could have caused jamming problems with the assembly machinery. By the end of January approximately 677,000 outgoing and 250,000 return envelopes had been rejected for these reasons. Most of these were salvaged in a hand operation which simultaneously used "rejected" questionnaires, instruction sheets, and envelopes which were otherwise satisfactory for use.

Maintaining a balanced flow of the D-9 return envelopes to the assembly plant so that work stoppages could be avoided was the major difficulty encountered in envelope procurement.

Questionnaires and Instruction Sheets

In October 1968 the major questionnaires were submitted to the Bureau of the Budget (now the Office of Management and Budget) for approval. The first requisition for printing questionnaires was submitted to the Government Printing Office (GPO) in December 1968.

It was agreed that GPO would print the short questionnaires, but that the sample questionnaires and the various instruction sheets would be printed commercially. Accordingly, GPO invited bids for these in February 1969, and awards subsequently were made to four commercial firms, of which three were in the Washington metropolitan area and another in the Midwest.

Printing plates for the short household questionnaires were prepared in January 1969, and printing at GPO began at the end of February. Printing of the sample questionnaires was delayed until April because of several last-minute changes. These were made (1) to change the wording of the category "Yes, but shared with another household" in the kitchen and bathroom facility items to "Yes, but also used by another household;" (2) to change the seal on the questionnaire covers from that of the Department of Commerce to that of the United States, and (3) to revise the wording of the confidentiality statement. The latter changes required the preparation of new printing plates. In May 1969 production of the 5-percent sample questionnaire was halted to insert a new item (13b, Spanish origin and descent). The 5-percent questionnaires already printed were reserved for camera testing (see p. 16).

In April 1969, plates were prepared for the Form D-24 cover letter from the Secretary of Commerce. This letter called attention to the importance of the census to the Nation and emphasized the confidentiality of the respondents' answers, and was to be mailed with the D-1, D-2, and D-3 household questionnaires. It was not included in those mailing pieces which had been stuffed and sealed by this time, but was received by over 30 million households in mail areas. In August the size of the letter was reduced to 5" x 8" to eliminate a folding operation. The letter was incorporated in the D-14 wraparound cover for the advance census questionnaire distributed in conventional census areas, and the plates for this cover were changed accordingly.

In the spring of 1969 the "Individual Census Report," Form D-20, was designed, and the content of Form D-23, "Overseas Census Report," was determined. By July 1969 almost all public use forms except the questionnaires for the military were in production or had been ordered. By November, printing of all the questionnaires and instruction sheets was virtually complete, with the exception of the D-2 15-percent household questionnaire and a new form, D-27, "Overseas Travelers' Report," that was designed for distribution to passengers on ships and planes around Census Day.

The D-1, D-2, and D-3 questionnaires destined for use in mailing packages were shipped to the assembly plant in the same type and size of reusable container as were the envelopes.

Procurement of the principal questionnaires and instruction sheets is summarized in the following table. The total printing cost for all public-use documents

Table 1. **Principal Contracts for Printed Household Questionnaires and Instruction Sheets**

Form No.	Description	Total quantity received	Delivery period	Contractor	Cost
D1	Short questionnaire, 4 pages, 26-3/4"x 10-7/8" with fold-in on pp. 1 and 2 to 9-1/2"x10-7/8", then folded to 4-13/16", white offset sub. 100	[1]55,300,000	April-November 1969	Government Printing Office (GPO)	$756,098
D2	15-percent long questionnaire, 20 pages, 9-1/2"x10-7/8" with fold-in on pp. 1 and 2, then folded to 4-13/16", white offset sub. 100	[2]11,900,000	April-October 1969	Commercial	$609,200
D3	5-percent long questionnaire, 20 pages, 9-1/2"x10-7/8" with fold-in on pp. 1 and 2, then folded to 4-13/16", white offset sub. 100	[3]4,400,000	May-September 1969	Commercial	$264,653
D4	Short questionnaire example and instruction sheet, 14"x11" folded to 5"x11", canary newsprint	[4]40,300,000	April-October 1969	Commercial	$157,441
D5	Long questionnaire example and instruction sheet, 24"x11" folded to 5"x11", canary newsprint	[5]11,000,000	April-October 1969	Commercial	$69,188
D11	Short questionnaire, 4 pages, similar to D1, used in conventional enumeration areas	[6]18,600,000	April-September 1969	GPO	$195,393
D12	15-percent long questionnaire, 9-1/2"x 10-7/8" with fold-in on pp. 1 and 2, white offset sub. 100	[6]7,300,000	April-August 1969	Commercial	$357,281
D13	5-percent long questionnaire, 9-1/2"x 10-7/8" with fold-in on pp. 1 and 2, white offset sub. 100	[6]2,500,000	April-August 1969	Commercial	$119,322
D14	Wraparound instruction sheet (perforated) and form D11, folded to 4-3/4"x10-7/8"; white offset sub. 100	[6]30,700,000	June-December 1969	GPO	$624,298

[1]Included approximately 17,800,000 without final fold, delivered between May and September 1969.
[2]Included approximately 4,850,000 without final fold.
[3]Included approximately 1,850,000 without final fold, delivered between April and September 1969.
[4]Included approximately 2 million Form D-4s (Spanish translation).
[5]Included approximately 500,000 Form D-5s (Spanish translation).
[6]Includes Alaska.

(including envelopes) was approximately $120,691 in fiscal year 1969, $3,970,340 in fiscal year 1970, and $29,921 in fiscal year 1971. These figures include Bureau overhead expense.

Quality Control of Questionnaire Printing

Introduction.--In order to minimize clerical and professional intervention in processing 1970 census data, great emphasis was placed on the use of the respondent's or enumerator's entries--in the form of blackened circles on the household questionnaire--as input for an optical sensing process called FOSDIC (Film Optical Sensing Device for Input to Computer). The FOSDIC scanning equipment used by the Bureau of the Census "read" a microfilm copy of the printed and hand-marked census questionnaire and converted the data it read to magnetic tape. In microfilming this copy was reduced by a factor of 23.3 to 1, so that the image was only about 4 percent of the size of the original questionnaire. As the FOSDIC process identified the data in terms of the blackened circles or other marks in certain exact positions and sequence on the micro-sized documents (on film) being scanned, each element--spacing, density of the marks, etc.--had to be controlled within narrow limits. In terms of the questionnaires, it meant that the printing placement of those parts to be "read" by FOSDIC had to be controlled within a tolerance of 1/200 of an inch. Other characteristics, such as the size of the folded questionnaire, the properties of the ink and paper, the number and placement of staples, etc., could not deviate markedly from designated limits (see below) without generating a substantial percentage of FOSDIC reading failures. Thus many of the printing specifications for the 130 million household questionnaires (104 million short and 26 million long) used in 1970 allowed less variation than the usual commercial printing standards.

In 1968 and early 1969, following the research described below, Bureau specialists in quality control procedures participated in planning contract specifications for the questionnaires. Between May 1969 and January

1970, a period of 9 months, 10 staff members supervised on a full-time basis the questionnaire printing and assembly; they were assisted as necessary by three or four other persons. The total cost of this quality control operation was approximately $81,000.[2]

Research and development.--To be useful in the mass-production filming process being developed for the 1970 census, in which light or camera settings could not be changed for every variation in the questionnaires being microfilmed, the paper and printing had to be of such uniformity that no unacceptable variations would occur in the filmed images that subsequently had to be "read" within the narrow tolerances of the FOSDIC system. Specifications for printing in the 1970 census therefore depended on the capabilities of the microfilming and FOSDIC systems. A research project was undertaken in the summer of 1968 to provide answers to the following questions:

1. What are the permissible limits, in a production situation, on the following paper characteristics:

   a. Reflectance or brightness--the percent of incident light reflected (critical to the functioning of the FOSDIC process).

   b. Opacity--the percent of light not transmitted through the paper (important to ensure that printing or marking on one side of a page would not be read on the reverse side).

   c. Grain direction--the relationship of fiber direction in the paper to the direction of the fold. (Initially this was considered important because of the effects of creases in automated filming; later testing indicated that this was not significant.)

2. Would any standard paper specification meet all system requirements? (Cost and procurement advantages of a standard paper were significant.)

3. What special tests would be necessary on the paper used?

As a result of this research, carried out by the National Bureau of Standards (NBS) for the Census Bureau and summarized in NBS Technical Paper #9900, August 22, 1968, it was determined that a standard white offset substance 100 paper, conforming with U.S. Government description JCP A-60, would be satisfactory, provided all specifications of the standard were fulfilled and that standard measurement procedures could be utilized.

One of the most significant research finding was that standard JCP A-60 paper which fell within the reflectance limits in standard industry tests (e.g., TAPPI Method T452 M-58) was inside the permissible range of reflectance for the FOSDIC process even though the TAPPI tests were carried out in a different spectral region from the FOSDIC operating environment. Special arrangements were made for NBS laboratory testing of paper samples to be taken periodically from printed sheets produced by all suppliers of the household questionnaires.

[2] See p. 1.

Coincident with this research, developmental testing was carried out to confirm that the new thin microfilm developed for 1970 census processing would operate successfully with the specified paper in a production environment.

Specifications.--Paper brightness could range only between 78 and 81 percent, so that microfilm frames would not have widely differing photographic densities. Opacity tolerance was established at not less than 90 percent. The paper used also had to pass tests for smoothness and cleanness, since FOSDIC would interpret embedded dirt particles in certain areas as data responses. The established tolerance for dirt content was no more than 10 parts per million.

The ink used for printing had to be nonreflective (i.e., the ink's reflectance on the paper could not exceed 10 percent), nonbleeding with the paper used, capable of rendering fine lines, and smear-resistant in the presence of moisture.

The printing itself had to be free of ink and grease smears on the unprinted portion of the page, and free of sizable light or uninked spots in solidly printed areas, particularly where index marks and shadow bars were located. (The shadow bar indicated to the automatic microfilming equipment the separation between two facing pages. If the pages were not properly folded in the assembled questionnaire, the shadow bar would not be of full width and therefore would not be recognized by the camera.) Line thickness of FOSDIC marking circles had to be very closely controlled so that a heavily printed circle would not be interpreted as an entry. The tolerance allowed on the circles was 0.004 inch, plus or minus 0.001 inch.

The dimensions of the printed questionnaires, unfolded and folded, were required to be as follows:

1. The 20-page long questionnaire (printed commercially) consisted of a 16-page signature, 9 1/2 by 10 7/8 inches, with a printed wraparound self-cover 26 3/4 by 10 7/8 inches. Pages 1 and 2 had a 7 7/8-inch fold, then a second fold to 9 3/8 inches.

2. The 4-page short questionnaire (printed by the Government Printing Office) consisted of a 1-page signature, 26 3/4 by 10 7/8 inches, printed on both sides. Pages 1 and 2 had a 7 7/8-inch fold, and a second fold to 9 1/2 inches.

The trim size of both the long and the short questionnaires was 9 1/2 by 10 7/8 inches. Some questionnaires were further folded to 4 13/16 inches by 10 7/8 inches (see table on p. 14).

The binding specifications for the long questionnaire (the short questionnaire was neither stapled nor bound) involved the use of four staples on the left 10 7/8-inch side--one staple 1 1/2 inches from the top edge of the pamphlet to the edge of the staple, one staple 1-1/2 inches from the bottom edge of the pamphlet to the edge of the staple, and two staples spaced evenly between the first two.

The permissible widths of margins were established initially but were changed a number of times by the

Bureau. The precision of the margins was less important than the precise position of the printing and the shadow bars.

The specifications which caused the greatest difficulty from the standpoint of quality control were those which dealt with the binding operation rather than with the printing; other difficulties were encountered with such items as the minimum width of the solid shadow bar after folding, and trim requirements below the shadow bar, where no white area was permitted.

Inspection procedures.--The quality control plan for paper and printing was essentially the same for the short and long questionnaires, and was carried out in the following manner:

Census Bureau inspectors made daily visits to GPO and the commercial contractors. They picked up numbered press sheet samples which were pulled in the following manner: three from every 5,000 sheets of the first side printed, and three from every 5,000 sheets of the second side printed. These samples were tested at the National Bureau of Standards for conformity to paper and ink standards and at the Census Bureau for FOSDIC acceptability.

Presswork inspection included checking of paper for excessive brightness and blemishes, and of the overall inking to detect printing dropouts, light spots in the index marks and shadow bars, ink spots within the FOSDIC marking circles, improper wall thickness of the FOSDIC circles (i.e., more than .001 inch variation from the specified .004 inch in either direction), and exaggerated show-through of printing.

Bindery inspection of completed, bound questionnaires was made to ascertain that they were of the proper trim and folded sizes, that visual check marks appeared on all pages, that proper specifications regarding the bleed and width of the shadow bar at the bottom center of each page were maintained, and that the questionnaires had four staples placed directly in the center of the fold. An overall visual examination was made of random samples for printing, assembly, and binding acceptability. Also, a random inspection was made of the packing operations to assure that they met contract specifications, and a check was made to determine if all cartons were numbered consecutively. A systematic sample of one questionnaire per 10 cartons was drawn by the bindery before the cartons were stacked on skids and the sample was identified by the carton number.

A daily record was maintained of all acceptable and unacceptable sheets and questionnaires, and a daily report was made to GPO of inspection findings.

Skids of press sheets that failed sample FOSDIC testing were held in the contractor's plant for further inspection. The prenumbered press sheet identified the skid and position from which the press sheet was pulled. The inspector checked press sheets between the previous acceptable sheet and the following acceptable sheet before releasing the skid for bindery operations.

Skids of bound questionnaires in which defective samples were found were held at the contractor's plant. After the defective questionnaires were removed, the skid was resampled and, if acceptable, released for shipment. (A skid held about 30,000 short or 7,200 to 15,000 long questionnaires.)

After shipment, questionnaires were sampled at their destinations; all skids were included in this sample. At the mailing-piece assembly plant or at the Census Bureau installation in Jeffersonville, Ind. (where unaddressed questionnaires were packed for distribution) a sample pair of questionnaires was drawn at the rate of 10 pairs per skid. Samples drawn by the commercial assembler were forwarded to the Bureau for a visual check; samples drawn at Jeffersonville were checked on the spot by Bureau personnel. Detection of any samples with critical FOSDIC defects would cause all the questionnaires on the skid to be rejected. For long questionnaires, rejected skids were set aside and defects were reviewed by printers' representatives; they either removed defective questionnaires on site, returned the skid to the bindery for salvage, or agreed that certain skids were bona fide rejects on which further work was not feasible. Defective short questionnaires (all from GPO production) were removed by Bureau personnel.

Results of quality control.--The results of quality control were as follows:

1. Paper.--During the period that paper samples were inspected by the National Bureau of Standards (NBS) only one instance was detected where a printer did not use the type of paper specified. This problem arose because the printer started production with "better"--i.e., more expensive and brighter--paper than that meeting standard JCP A-60. The reflectance of the paper used exceeded the specified limits and would have caused some FOSDIC rejections. At about this time the wording of the 5-percent sample questionnaire involved was changed, and it was decided that the few 5-percent questionnaires already printed would be used strictly for camera testing.

After several weeks of paper testing, including reconciling of measurements between GPO and NBS laboratories, the results indicated that several individual samples of paper fell outside the reflectance limits of the JCP A-60 specifications. The incidence of excessive brightness appeared so sporadic that it was decided that the cost of removing paper outside the brightness limits from purchased stocks would be much higher than the cost of reprocessing FOSDIC rejects resulting from the use of such paper. Consequently the NBS laboratory checks of paper samples was discontinued, and the FOSDIC check was used to detect only gross changes of brightness that would be caused by substitution of another grade of paper.

2. Printing.--The results of the FOSDIC check of printed sheets were as follows:

Printer	Number of samples	Number rejected	Percentage of samples rejected
Total.....	8,431	64	0.76
GPO.....	6,564	19	0.29
Commercial...	1,867	45	2.41

No information is available on the total number of questionnaires destroyed in cleanout operations re-

sulting from these rejections. After printing began it was determined that a FOSDIC test which was more sensitive and discriminating than the test then being used would be applied to all questionnaires. Since samples checked under the original test had been destroyed, the new test was applied to samples drawn from accumulated delivered questionnaires; there were no additional rejects.

3. Finished questionnaires.--The questionnaires delivered to the Bureau's facility in Jeffersonville and to the mailing-piece assembly plant were sampled and inspected by Bureau personnel. Of 2,974 skids of questionnaires delivered by GPO, only 12 were rejected, but 222 of the 2,228 skids of the commercially printed long questionnaires failed to pass inspection. These rejected skids represented about 2.32 million of the 26.1 million long questionnaires printed. The most frequent cause for rejection (29 percent) was a too narrow or otherwise obscured shadow bar; the next most frequent cause (10 percent) was uncut pages. A number of the defective questionnaires were used for training purposes, and all but about 66,000 questionnaires (0.03 percent) were salvaged.

Problem areas.--While the specifications and quality control procedures described above produced acceptable questionnaires as end products for the Bureau, the following aspects of the printing process were troublesome:

1. Copy preparation.--In preparing camera copy for the major questionnaires, visual marks on all papers were not placed at the exact minimum position for FOSDIC acceptability, but were placed on the page with a builtin tolerance. The absence of a visual mark on the printed page should have made the questionnaire unacceptable; instead, when the visual marks did not appear the questionnaire was measured to determine FOSDIC acceptability. Various standards for these measurements were furnished verbally, causing uncertainty over what would be accepted or rejected. Specifications for the shadow bar required that it bleed off the bottom of each sheet and that it be a minimum of 3/8" wide. The bar was not sufficiently extended in depth and width on the camera copy to assure both bleed and minimum width after binding; instead, verbal measurement standards had to be furnished to determine FOSDIC acceptability when the bar did not bleed in subsequent printing.

2. Size.--The original Bureau specifications required finished questionnaires to be 9-1/2" x 11"; these dimensions were changed by GPO to 9-1/2" x 10-7/8". While the latter size was satisfactory for GPO equipment, it caused binding problems for the commercial printers.

3. Quality control.--The 24-hour limitation specified in the contracts for notification of press sheet acceptability frequently was difficult to meet because of personnel limitations. Further, the acceptance criteria tended to vary among the separated points where quality control was carried out, e.g., at the printers' plants, at the Bureau, and at the mailing piece assembly plant. A rigid final inspection sometimes caused rejection of previously accepted questionnaires.

QUESTIONNAIRE MAILING PACKAGES

Introduction

Two enumeration procedures were used for the 1970 census--the mail-out/mail-back census technique and the conventional method of direct canvass of dwellings. The latter was for the most part the same method which had been used in past censuses; the former, however, was a technique never before used on a large scale in the national population and housing census.

A large number of metropolitan areas, containing about 60 to 65 percent of the United States population, were designated as mail-out/mail-back areas (see fig. D, p. 20). For housing units located in these designated areas a mailing piece (or package) was sent to each address. Each package contained a questionnaire, an instruction sheet, an explanatory letter, and a return envelope. The householder was expected to complete the questionnaire and mail it back in the return envelope to one of the Bureau's field offices.

It was estimated that some 45 million mailing packages would be required. Of these, it was expected that about 40 million would have machine-prepared address labels affixed to them and the balance would be addressed by hand in local census offices. Following competitive bidding on this basis, a private firm was awarded a contract in December 1968 to assemble the mailing packages and to affix the address labels to them at an overall rate of $9.85 per thousand packages. Assembly began in late May 1969 and continued through early fall. The labeling was started in late November 1969 and finished in February 1970; both operations took place in the contractor's plant in North Carolina.

Assembly

Four different types of mailing packages, designated as I, II, III, and IV, were assembled. The contents are described in the following table in terms of the census form number for each of the components.

Table 2. **Contents of Mailing Packages by Type**

Contents	Type of mailing package			
	I Form	II Form	III Form	IV Form
Mail-out envelope, containing one each of the following.....	D-6	D-7	D-8	D-6
Questionnaire.....	D-1	D-2	D-3	-
Instruction sheet[1].....	D-4	D-5	D-5	-
Letter from the Secretary of Commerce.....	D-24	D-24	D-24	-
Return envelope[2].....	D-9	D-9	D-9	-
Special-place letter.....	-	-	-	D-22

- Represents zero.

[1]Mailing packages for selected areas also contained an instruction sheet in Spanish.

[2]Envelopes with 212 different return addresses were inserted.

Of the mailing packages which included questionnaires, 80 percent (36.7 million) were type I, and contained the short questionnaire covering the population and housing inquiries asked of all households; 15 percent (6.8 million) were type II, and 5 percent (2.2 million) were type III.

Type II and III packages, respectively, contained the 15- and 5-percent sample questionnaires; these long questionnaires included all of the inquiries found in the short questionnaire, plus certain sample items. Type IV packages (0.3 million) contained only one insert, a notice to each "special place," i.e., a hotel, boarding house, dormitory, or other group quarters, that an enumerator would visit the place to obtain census information about the occupants.

The mail-out envelope into which the materials were inserted had two cutout windows, one in the front and one in the back. Through the open window in the front the address label for the housing unit was affixed to the questionnaire inside; through the back window the address of the local census office (212 different variants) on the return envelope was visible.

Arrangements were made by the Census Bureau for the delivery of all bulk materials directly from the various suppliers to the contractor. It was the contractor's responsibility to inspect the materials on arrival, determine the acceptability, completeness, and conformity with specified types and sizes, detect damage in transit, and to report any defects. Materials began arriving in early May 1969 and assembly, using mechanical inserting machines, started shortly thereafter.

Problems with materials and inventory controls were encountered which affected production in the assembly operation. In addition to the problems involving the envelopes (see p. 13), some questionnaire instruction sheets, which were lightweight and crumpled easily, jammed the machinery. Inasmuch as 3 million more instruction sheets were needed, these were ordered to be imprinted on 40 lb. writing stock. (In the dress rehearsals the instruction sheets had been printed on 40 lb. paper. For reasons of economy newsprint was selected for the D-4 and D-5 instruction sheets printed for 1970, but was not subjected to assembly tests.)

To provide for possible shortages in some district offices, 3.7 million mailing packages (in proportion by type) containing return envelopes without return addresses were assembled. (The district offices were provided with hand stamps to address the blank return envelopes; where needed in quantity these addresses could be imprinted at the Bureau's Jeffersonville facility.)

After assembly the mailing packages were stored so that all of the packages with the same census office address on the return envelope were together and sorted by package type until ready for the labeling operation.

Quality control of the assembly operation utilized a lot-acceptance sampling plan, with the criteria for acceptance or rejection of a lot based upon the number of defective packages found during sampling inspection. A defective package was one whose contents differed from those stated in table 2. Clusters of five mailing packages were sampled. The number of clusters in a lot depended on the size of the inspection lot and the type of mailing package as indicated in table 3.

Two checks were performed on the sampled packages: (1) A balance scale was used to detect missing or duplicate inserts, and (2) the symbol (blank, Δ , or ●) on the questionnaire was compared with the symbol on the mail-out envelope to ensure that they were both of the same type. The lot was accepted if no more than three defective packages were found in it during the inspection; otherwise the lot was rejected and every package in it was inspected and salvaged as necessary.

Table 3. **Inspection Lot Criteria for Quality Control of Mailing Package Assembly**

Package type	Minimum lot size	No. of clusters sampled	Av. No. of pkgs./box
I	60 boxes or 15,000 packages	1 every other box	250
II	80 boxes or 12,000 packages	1 every third box	150
III	30 boxes or 4,500 packages	1 every box	150
IV	60 boxes or 34,000 packages	1 every other box	575

Labeling

In the last week of November 1969, rolls of printed address labels began arriving for the labeling operation. Each label, which had printed on it the type of mailing package and the number of the return district office as well as other identification codes, was affixed by machine to the questionnaire through the center of the open window in the mail-out envelope. No more than one-quarter inch variation in any direction was allowed in the placement of the label on the questionnaire. (The contractor was given the option of doing either the assembling or the labeling first, but chose to do the former since spoilage during mechanical assembly of the packages would have required reprinting of some of the labels.)

Approximately 31.4 million mailing packages were labeled (rather than the originally expected 40 million). The remaining 14.6 million unlabeled packages were hand-addressed as part of the Bureau's fall and spring prelisting operations (see chapter 5) and as needed to complete mailing in the various district offices.

The labeled packages were placed in shipping cartons by ZIP code of the individual household addresses, with packages for only one ZIP code and type of questionnaire in each carton. An address label to the ZIP code's postmaster was pasted on the outside of the carton.

Quality control of the labeling operation employed a continuous sampling plan, with one labeled package sampled out of every carton. Two checks were performed on the sampled package:

1. The symbol on the address label (blank, Δ , or ●) was matched with the symbol on the questionnaire to ensure that both were of the same type, and

2. The district office number on the label was matched with the address on the return envelope to ensure that the questionnaire would be returned to the correct district office. A comparison

sheet listed all district office numbers and their return addresses.

If an error was found, 100-percent verification and correction were made of the entire carton and also of the cartons immediately before and after it until a carton with no errors was found.

After checking, the cartons were stored by the first three digits of the ZIP code while awaiting shipment to the Post Office sectional centers (where they would be sorted by 5-digit ZIP codes and sent to the local post offices).

Shipment

Addressed mailing packages.--Extensive coordination among postal officials, Bureau staff members, and the contractor's personnel began in 1969 so that shipments to each Post Office sectional center could be planned and the carriers and transfer points selected.

One final quality control check, charged to the contractor and instituted because performance of the assembly quality control was found to be inadequate, was made before the shipping cartons were loaded. One package was sampled from each carton and the following checks were performed:

1. The label symbol was matched with the questionnaire symbol.

2. The district office number on the label was matched with the return address.

3. The ZIP code on the address label was matched with the ZIP code on the shipping carton to ensure that the carton was being shipped to the correct post office.

4. A tally of the total number of cartons by type for each ZIP code was compared with a computer count of the number of addresses for each ZIP code to reveal any large discrepancies in totals. The carton count was used also to resolve inquiries from local post offices concerning the number of cartons shipped and received.

With two postal officials supervising the task, the contractor's personnel began loading the Post Office trailers on February 18, 1970. (These trailers were of the "piggy-back" type, capable of being hauled by truck or carried on railroad cars or ships.) Each carrier, postmaster, and postal region was notified by telephone by the Census Control Clerk of the Post Office region in which the contractor's assembly plant was located of the exact leaving dates and trailer numbers. Complete monitoring of the movement was maintained through several controls: All carriers were required to report by telephone to the Census Control Clerk the times trailers were received and the times they were dispatched to connecting carriers. The destination postmasters were required to acknowledge receipt of shipments or to advise of nonreceipt if the census material had not arrived by the expected time, March 4, 1970. If by March 7 the local post office had not received a quantity of addressed mailing packages (labeled and/or hand-addressed) approximately equal to the total number of households it served in census mail areas, the postmaster was directed to notify the Census Coordinator at the appropriate Post Office sectional center. These shipments were made successfully, with only isolated instances of misrouted cartons. (Hand-addressed mailing packages from the prelisting operations and the labeled packages were shipped in a similar manner, with their arrival at the local post offices planned to allow national delivery of all questionnaires at the same time.) Post Office operations are described below.

Unaddressed mailing packages.--Beginning in October 1969, the contractor shipped 5.4 million unlabeled mailing packages to five different locations in the country where they were addressed by hand as part of the Bureau's fall prelisting operation (see chapter 5). Beginning in January 1970 additional unlabeled packages were shipped to the Bureau's Jeffersonville, Ind., facility for distribution to district offices engaged in spring prelisting operations, but these shipments represented less than 50 percent of the quantities needed. Because the labeling operation was still going on, it was decided not to release further quantities of unlabeled packages at this time, but rather to have the contractor send them directly from his plant to the district offices after the labeling was completed. The decision to do this was based on several considerations:

1. During the labeling operation the contractor's supply of mailing packages would not be endangered; after completion, the remaining stock of unaddressed packages could be checked for quality and shipped.

2. District offices would be able to gauge their needs more accurately after the number of "yellow cards" (addresses without tract and block numbers) was known, and after the Post Office performed its check of the addressed mailing packages in early March and reported missed addresses. This would avoid over- and under-shipping and obviate ordering more packages than were actually needed, even though shipping costs would be higher than if these shipments were sent in the initial district-office shipments from Jeffersonville.

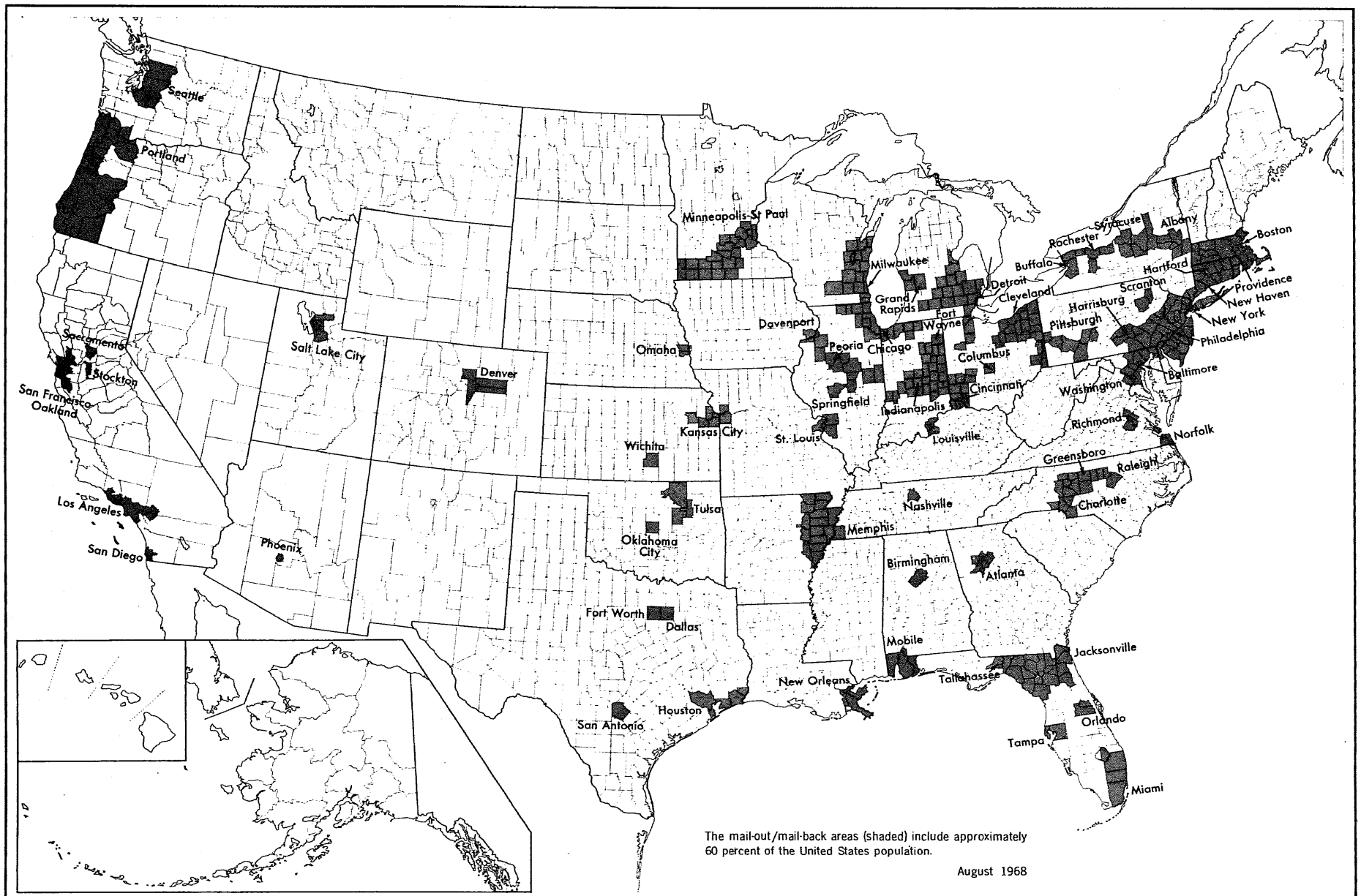
Although labeling was completed by the set deadline, the bulk of the labeling occurred toward the latter part of the production schedule; many unaddressed packages therefore were not released until late February, and some had to be shipped to the district offices by air, at additional expense to the Bureau. Time pressures in completing hand-addressing in the district offices, caused by late arrival of mailing pieces, forced some hiring of extra personnel in order to meet mailing deadlines.

POST OFFICE OPERATIONS

Planning and Preliminary Activities

A high degreee of cooperation between the Post Office Department (now the United States Postal Service) and the Census Bureau was necessary for the 1970 Census of Population and Housing, because the innovative mail-out/mail-back enumeration procedures that were used required (1) the checking of addresses and address lists for completeness, (2) the delivery of questionnaires to every residential address, and (3) the return of completed questionnaires to the Census Bureau.

Figure D. Mail-Out/Mail-Back Areas in the 1970 Census



The mail-out/mail-back areas (shaded) include approximately 60 percent of the United States population.

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Every mailing address had to be adequate not only for postal delivery but also for an enumerator to locate if a personal visit was necessary. It likewise was important that no housing unit be overlooked in the census. The Post Office therefore performed several checks of the Census Bureau's addresses to make certain that they were complete and that none were missing. Shortly before April 1, 1970, the Post Office delivered approximately 43 million addressed census mailing pieces to housing units in large metropolitan areas and adjacent counties (see fig. D). (A "mailing piece" comprised an envelope containing a questionnaire, an instruction sheet, and a return envelope.) When the filled-in questionnaires were mailed back, the Post Office delivered them to the appropriate census field offices or other designated places. The Post Office also delivered about 23 million unaddressed questionnaires to the remaining housing units in the country, where they were later collected by census enumerators.

Preliminary planning of Post Office operations for the 1970 mail-out/mail-back enumeration was begun in 1966 between the Census Bureau and the Post Office Department. In March 1967 a career postal employee was appointed as Special Assistant (later called the Census/Postal Liaison Officer) to the 1970 Census Coordinator to advise the Bureau in its planning and to assist in coordination of subsequent efforts.

Arrangements with the individual post offices were made through the 15 administrative regions of the Post Office Department. The superintendents of delivery and collections were appointed as the local coordinators at large post offices, and the equivalent of an assistant superintendent was appointed at smaller offices. Each regional director appointed a regional census coordinator (usually the chief of the Distribution, Delivery and Vehicles Branch of the regional office) to work with postmasters and with the local coordinators. The regional coordinator was notified by the local coordinator when any shortages of supplies were encountered or anticipated. The local coordinators also made certain that census questionnaires and postal instructions, which were delivered addressed to "Postmaster," were redistributed to each carrier delivery unit, station, or branch. In communication of instructions and pertinent information, the Post Office's general chain of command was observed. Another vehicle, The Postal Bulletin, which was required reading for postal personnel proved to be an efficient means of transmitting general announcements of the program, calendars of activities, and explanation of instructions. Regional bulletins were used to convey information of local concern. Census Bureau staff members, including the Census/Postal Liaison Officer, kept in contact with the regional coordinators, offering advice and information as needed.

Programs then were developed for the pre-enumeration operations described below, as well as for the sorting and return of completed questionnaires to the local census offices. The appropriation for the Nineteenth Decennial Census included the cost of the Post Office services.

In late 1967, the Census Bureau requested maps from all post offices providing city delivery services in the 145 SMSA's (standard metropolitan statistical areas) where it was planned to use mail-out/mail-back enumeration procedures in 1970, in order to determine the boundaries of the areas these post offices served. The boundaries were used as the basis for selecting (1) the address lists to be obtained commercially and checked by the Post Office for completeness (see below), and (2) the areas for which mailing addresses would be listed by Bureau employees in a field canvass.

In the summer of 1968, all postmasters in the Nation reported to the Census Bureau the types of service their post offices provided--city or rural delivery, window delivery, etc.--and the counties which they served. All post offices were grouped according to the method of delivering the census questionnaires: (1) "unaddressed" areas (corresponding to the Census Bureau's conventional, or "nonmail" areas), where mail carriers delivered unaddressed questionnaires to all households; (2) "addressed" areas (census "mail" areas), in which addressed questionnaires were used; and (3) "mixed" areas, where individual post offices served both mail and nonmail census districts. From this grouping, a determination was made of how many post offices and how many carrier routes at those offices would be involved in the various census programs. Quantities of supplies, forms, and materials for the census and for the postal operation were procured on the basis of the type of service the post office provided. Supplies for the various areas involved in the census programs included those for the address check, casing, the movers check, time-of-delivery check, and the post-enumeration Post Office check (for these operations see headings below).

One set of instructions on delivery of census questionnaires for postmasters, station supervisors and all other delivery unit supervisors and another set for letter carriers--city delivery, rural route delivery, star route delivery--and lockbox and window delivery personnel, were mailed on February 18, 1970. Special instructions were provided for postmasters in Alaska and Puerto Rico (see p. 26).

Pre-Enumeration Operations

Address check.--Prior to the delivery of questionnaires in the 1970 census, an advance address check program, designed to disclose missed or inaccurate addresses on the census mailing list, was conducted for city delivery routes in mail census areas. This program, involving 1,384 post offices and approximately 34 million addresses, was conducted between February and October 1969, and resulted in about 8 million corrections and additions to the address registers.

It had been proposed originally that the address check begin in the fall of 1968, but planners decided that the address registers would be obsolete if they were updated so far in advance of the March 1970 mailing of census questionnaires. It also was concluded that the program should start at a slow pace until the procedures were worked out and perfected, gradually building up to maximum production. The address check in States with the highest growth rates was scheduled last so that fewer adjustments would have to be made because of address changes occurring between the time of the address check and the census. The scheduled starting dates were staggered across the country to provide maximum efficiency in organizing meetings and processing the work.

The Bureau prepared from its preliminary mailing list approximately 33.9 million address labels, which were attached to cards. During the summer of 1969 these addresses were checked by letter carriers for completeness and accuracy and returned to the Census Bureau where revisions in the lists were to be reviewed.

Meetings were held in each Post Office region between January and July 1969, to explain the instructions for conducting the address check. Those attending included station or branch supervisors from each city delivery unit, the postmasters or their representatives, Census Bureau representatives, regional postal officials, and representatives of the personnel (i.e., clerks, carriers, etc.) involved in the address check. Postal supervisors were advised to bring with them copies of their own instructions as well as the carriers' instructions, as the supervisors were responsible for making certain that their carriers followed the procedures.

This process was conducted in two stages, Part I, consisting of the preparatory work, and Part II, the actual check. Progress reports were submitted weekly during Part I.

Part I.--Each carrier filled out a report on the multiunit residential addresses on his route, indicating the location of any unnumbered housing unit. For any building with which he was unfamiliar, he provided the owner or manager with a form to be completed with the necessary information. Those carriers who delivered mail to large estates on which there were unknown numbers of dwellings without specific street addresses completed a form describing the dwelling location. In addition, each carrier was given a form on which he listed the home addresses of residential lockbox patrons on his route. Lockbox clerks checked this list against a list of lockbox patrons, and provided names and addresses for those not on the list.

Part II.--Part II of the address check was performed entirely within the post office over a period of 15 days, starting the day the supervisor received a transmittal notice of the number of census address cards for his office. Each carrier received a set of address cards representing housing units on his route which were on the census address list. He cased the address cards, i.e., he sorted them in delivery sequence for his route by placing them in pigeonholes (separations) in his sorting case. He also cased the location information and dwelling location description forms completed in Part I of the address check. He then (a) reported housing units for which he had no card (or had more than one card), (b) corrected wrong ZIP codes, (c) corrected wrong apartment numbers, (d) described the location of separate housing units within a multiunit structure where numbers or letters did not appear on the doors to the apartments, and (e) identified "nixies" (i.e., addresses that were nonresidential, or no longer in existence by reason of demolition or conversion of the housing unit, or which were otherwise undeliverable).

Each missed housing unit was recorded on a list. All "special places" (motels, group quarters, institutions, etc.) without address cards were also listed. Cards and lists with completely accurate addresses were bundled together and labeled "satisfactory;" corrections, duplicates, cards for special places, and "nixies" were packaged separately.

As a quality control measure, a group of address cards was withheld for each route to determine how efficiently the carrier identified missing dwellings.

After time studies of the various operations performed by postal personnel, a cost factor was determined. The Census Bureau reimbursed the Post Office Department in the amount of $2,899,000, or about $0.08 per address, based on the approximate time required to complete both Parts I and II of the check.

Nixie check.--About 2 months after the address check, another quality control operation, called the "nixie check," took place. Postmasters were informed of this check in October 1969. Carriers involved received instructions and a set of address cards designated as "nixies" in the original address check. Cards for valid addresses were marked as satisfactory, while those that were classified again as incorrect or for nonexistent addresses were so marked with an explanation. Most cards were returned to the Census Bureau's Jeffersonville, Ind., facility within 5 weeks.

Movers check.-- Postmasters provided the Census Bureau with information from any change-of-address orders they received from postal patrons during the period March 1 through May 2, 1970, for the Census Bureau's "movers check," which took place in certain designated areas of 21 cities. The Bureau made this check according to census tracts. Postal clerks transcribed change-of-address orders each week and mailed them to the designated census district offices.

Preparation for delivery of addressed questionnaires.--The mail-out/mail-back system of enumeration was employed mainly in larger metropolitan areas and some adjacent counties. It was essential that each housing unit be identified by a distinctive dwelling-location address, complete in all respects, so that it could not be confused with another unit either by a postal employee or by a followup enumerator. This factor was stressed in the instructions given postal employees during the address check program (see above) when they updated and corrected the census address lists. As a result of this program, almost all of the checked addresses were satisfactory when they were later used on the mailing pieces.

In order to assure that the proper kind and amount of materials would be received in rural post offices in mail census areas, the number of rural routes and star delivery routes of each post office and the number of clerks serving lockboxes and general delivery window patrons were ascertained. (During the address check program, information concerning the number of city delivery carrier routes was obtained, but no questions were asked concerning rural delivery at that time.)

City post offices often had carrier routes which served both conventional and mail census areas. Postal supervisors had to determine which type of routes their units served and instruct the carriers accordingly, working especially closely with carriers whose routes crossed the boundaries between the two types of census areas (conventional and mail) and who therefore had to deliver both addressed and unaddressed census questionnaires.

In February 1970, postmasters (including those in "conventional" areas) received the materials they would need to deliver the census mailing pieces (except the questionnaires themselves).

Regional officials of the Post Office Department and the Census Bureau then met to review the delivery instructions and to learn more about their roles in the census. A meeting was held in each of the Post Office's 15 regional offices serving the continental United States, Alaska, and Hawaii. Postmasters (or their representatives) from large post offices located near the city where each regional meeting took place were also invited to attend.

Lockbox and general delivery.--As no household was to receive more than one census questionnaire through the mail, it was important to know if persons who picked up their mail at the post office also had mail delivered at home. It was not feasible to determine this information for general delivery patrons, but each post office boxholder of record was asked to indicate by completing a small card placed in his box whether or not he received home delivery of mail as well. This information was generally known by the personnel at small post offices without resorting to the use of such a form. At larger offices, however, postal personnel often did not know the patrons, and found information reported on the cards useful. Approximately 50 percent of the residential boxholders provided the information requested.

On March 11, postmasters in mail ("addressed") areas gave lockbox and window-delivery personnel a list of patrons who received mail only by picking it up at the post office.

Receipt and handling of addressed questionnaires.--The Bureau dispatched the addressed questionnaires for delivery to the housing units in mail areas to arrive at post offices on March 4, 1970, where they would be checked and stored until delivery. If they had not arrived by March 7, postmasters notified the local census coordinator. These shipments included both mailing pieces that had machine-addressed labels and those that had been hand-addressed for prelist areas.[3]

Some hand-addressed questionnaires showed inaccurate addresses. The extent of this problem in prelist areas indicated that when the census listing books were compiled, some street and house numbers designating dwelling locations were erroneously assumed to be the mailing addresses. In other instances the addresses listed were missing, illegible, faulty, or incomplete for mail-delivery purposes.

Census listers sometimes continued to list addresses by one rural route, not knowing that they had left the area served by that route. When this was done, the carrier generally treated the inaccurately addressed questionnaires as "nixies" at the time of delivery, and the Post Office returned them to the census district office.

Several problems were encountered in handling mailing pieces with address labels: some labels did not adhere properly, so that the mailing pieces could not be delivered; some address labels were not well-centered so that they adhered to the enclosed questionnaire and to the envelope as well. (In certain instances this caused the questionnaire to lose identity when it was removed from the envelope because the label was torn. Some recipients noticed this and entered their own addresses.)

Certain problems arose in the shipping process, possibly due to misunderstanding of instructions; these included improper abbreviation of destination names, with consequent misdirection, and improper numerical arrangement of the cartons. Carton labels were sometimes illegible or too lightly affixed.

In some cases mailing pieces were dispatched to local post offices before the scheduled date. In a few instances, post offices delivered the questionnaires early, while others did not receive them in time for the March 10 and 11 "casing" operation (sorting in order of delivery).

Many of the census district offices selected March 6 as the most acceptable date to deliver the hand-addressed questionnaires to the local post office. Some units, however, did not receive the mailing pieces until March 9, yet had to have them sorted for the casing operation on March 10 and 11.

Casing and "Blue Card" Operations.--On March 11, carriers who delivered mail in mail census areas cased the addressed questionnaires (i.e., the mailing pieces) for their routes in preparation for the scheduled March 28 delivery. (If March 11 was the regular carrier's day off, he did this work on March 10.)

In addition to carriers in residential areas, lockbox and window delivery clerks and business carriers also participated in the casing operation. Lockbox and window delivery personnel were given lists of all residential lockbox and window patrons who received mail only by picking it up at the post office. There had to be an addressed questionnaire, either to be deliverd to his home or to be picked up at the post office, for each person who lived in a mail census area. Clerks filled out a Form D-702, "Report of Missing Questionnaire" (blue card), for any lockbox patron the Census Bureau missed.

Mail carriers in the business districts of mail areas also received questionnaires for each address at which people might live on their routes. They were instructed to be especially conscious of any "special places," i.e., hotels, YMCA's, etc., which might have been missed.

Each carrier cased all census questionnaires for his route upon returning to the post office the afternoon of March 11 (or March 10), after having removed all other mail from his case. Any questionnaires for addresses not on that route were returned to the supervisor. Census questionnaires were not forwarded.

After casing all the questionnaires, the carrier examined them, one separation (i.e., one compartment in his sorting case) at a time, to identify missed locations and duplicates. Before removing any questionnaires for a separation, he performed a mental check by picturing how many structures he used that separation for and how many housing units were in each structure.

[3] Prelist areas were suburban areas that were outside postal city delivery zones, but which the Census Bureau wished to enumerate by mail-out/mail-back procedures.

The carrier then removed the questionnaires from a separation and prepared a blue card for each address the census missed, including a separate card for each housing unit at a multiunit address and any dwellings which were not eligible for delivery service but which he would serve if they were eligible. (He did not fill out forms for missed individual dwellings at "special places," however, as the entire "special place" address received one form letter informing occupants that they would be visited by an enumerator.) When the carrier found more than one addressed questionnaire for the same dwelling location, one was selected for delivery according to a prescribed procedure.

After setting aside in delivery sequence the questionnaires to be delivered March 28, the carrier gave his supervisor the extra questionnaires, the blue cards, and the "nixies," all separately bundled.

Prior to the casing operation, the supervisor had scanned all the addressed questionnaires. He then prepared a list of the different post office names and ZIP code numbers and recorded by each one the district office number found on the address label on the front of the mailing piece.

On March 12, the supervisor examined the blue cards on which missing questionnaires were recorded to see that each had entries for ED (enumeration district) number and serial number. They were then sorted by the district office code. Extra questionnaires were sorted by the ZIP code number. The blue cards and the extra questionnaires were sent to the appropriate census district offices as indicated by the supervisor's list; "nixies" were sent to the Bureau's Jeffersonville facility.

Mailing pieces that were found to be defective in the casing operation usually had illegible or incorrect handwritten addresses, or, in the case of printed addresses, improperly applied labels. Blue cards had to be completed for most of the defective mailing pieces (requiring hand-addressing of fresh questionnaires).

Continuing the "blue card" operation, supervisors sent the "Reports of Missing Questionnaires" (blue cards) completed by their carriers in the March 11-12 casing operation to the appropriate census office on March 12-13.

Many post offices, however, began reporting shortages of questionnaires and requesting additional blue cards as early as March 4. As the need appeared to be increasing rapidly, special measures were instituted (i.e., supplementary dispatches of blue cards to each postal regional coordinator and a reprinting of 200,000 blue cards).

As "Reports of Missing Questionnaires" (blue cards) arrived at local census offices, the addresses were added to the address registers where necessary, and mailing pieces containing appropriate 100-percent or sample questionnaires were addressed by hand and mailed out. However, some postmasters were missing so many of their questionnaires that they withheld the blue cards for those addresses on the assumption that the mailing pieces had been sent to another post office. Thus census officials had to advise postmasters and Post Office regional coordinators whether they should wait to complete the blue cards and, if so, for how long. They could not wait too far beyond March 13, because then there would not be time to have a new census questionnaire addressed and returned to the post office by March 27.

Delivery of Addressed Questionnaires

Delivery Procedures.--All questionnaires were scheduled to be delivered on Saturday, March 28. Where necessary, substitute carriers were allowed to deliver unaddressed questionnaires, but where addressed questionnaires were involved it was important that a carrier be familiar with the route in order to complete delivery within the allotted time. If the regular carrier could not work on March 28 and a satisfactory replacement could not be obtained, he was allowed to deliver addressed questionnaires on Friday, March 27.

On the morning of March 28, each carrier received census questionnaires addressed to each dwelling location for which he had prepared a blue card during the casing operation. He cased these questionnaires and the main group he had received previously along with his regular morning mail. He took all these questionnaires, his instructions, and a supply of blank blue cards with him on his route. For every dwelling location for which he did not have a questionnaire, he filled out a blue card while still at the delivery point. These cards were brought back to the office along with any questionnaires for addresses which received lockbox delivery or temporary general-delivery mail.

Some postmasters and postal supervisors reported that their delivery units failed to receive the census mailing pieces for which the blue cards had been submitted after the casing operation March 11. As a result, a second set of blue cards was completed for those same addresses on the delivery date, March 28, 1970. This caused more than the anticipated number of blue cards to be used, contributing to their shortage as well as adding to the number of mailing pieces to be accounted for. The duplication of blue cards and mailing pieces did not affect the overall quality of the address registers, however. In some areas, the mailing pieces addressed from the blue cards generated in the time-of-delivery check were confused with the incoming returns and were never delivered to the households; instead, the Post Office sorted and delivered the outgoing mailing pieces to the district offices with the incoming mail returns.

(Based on a sample of blue cards received in the census district offices after the Post Office casing and time-of-delivery checks, a post-census analysis indicated the following results of the "blue card" operation: For the "centralized" district offices, which covered approximately 7 million addresses, an estimated 200,000 blue cards (2.8 percent) were received, of which approximately 60 percent resulted in additions to the census--the majority in multiunit structures. For the "decentralized" district offices, covering approximately 35 million addresses, it was estimated that about 2 million blue cards (5.7 percent) were received. Of these, about 84 percent represented additions to the census address registers. Over three-quarters of these additions were for single-unit structures.)

Census procedures in mail areas were set up according to a strict sampling pattern so that a questionnaire of the

te type (100-percent, or 15-percent or 5-percent sample) would be delivered to every housing unit, occupied or vacant. However, the apartment numbers or letters were sometimes not displayed on the apartment doors of families in multiunit dwellings or on their individual mail receptacles. Some multiunit addresses did not have apartment numbers or letters at all, and alternative descriptions often were imprecise. Carriers facing such situations were able to deliver mailing pieces to the proper housing units only if they had sufficient experience on their routes to have gained personal knowledge of the actual location of each unit. In other cases, the carrier delivered all of the questionnaires for one street address to a building superintendent, or left them at a central location for the residents, with no assurance that ultimate delivery would be made.

Housing units in various stages of demolition, found particularly in the larger, older cities with urban renewal programs, presented other problems. While the census enumerators were instructed to search for residents in condemned buildings, there were no clear guidelines for postal delivery of questionnaires to such premises. Sometimes these addresses were deleted in the address check (or should have been and were not); some mailing pieces directed to housing units being demolished were delivered, while others were returned as "nixies."

Lockbox and General Delivery.--On March 28 clerks delivered census questionnaires to window-delivery patrons and put census questionnaires, including any mailing pieces brought back by carriers that belonged to lockbox patrons, in lockboxes for those patrons who did not receive carrier delivery. Lockbox and general-delivery distribution of questionnaires was most complete at branches or suburban stations of very large post offices, and at small post offices.

Military reservations.--Whether a military reservation was located in an addressed or unaddressed area (i.e., mail or nonmail), postal carriers were instructed not to deliver questionnaires to either the reservation headquarters or to the patrons living on the reservation; however, military personnel living off the reservation were to receive the questionnaires by mail. Some military reservation commanders and the supervisors in charge of the enumeration on some bases, however, prepared questionnaires for delivery by mail on the reservation. Last-minute arrangements therefore had to be made with postmasters in order to change the official plan, and to have the questionnaires delivered by letter carriers on these reservations.

Sorting and delivery of returned questionnaires.--In January 1969, the Census Bureau notified approximately 200 postmasters that their post office personnel were to sort returned census questionnaires before delivering them to the local census office or other designated places. Each postmaster was requested to indicate the ZIP code number he wanted printed on the return envelopes addressed to the census district office in his delivery area.

In March 1970 each centralized or decentralized census district manager in a mail-enumeration area provided the Post Office with a list of the ED (enumeration district) numbers in his census district, for use in sorting the mail-return questionnaires. In addition, managers of decentralized offices provided the Post Office with a list of the ED's in each crew leader district as well as the address of the place where each crew leader would train his enumerators, so that the questionnaires would be delivered to the appropriate training sites. (A centralized office was one from which followup was done from one location--the district office; a decentralized office was one from which followup was accomplished by individual enumerators working from their homes.)

The ED number was printed on the address label visible through the open window of the return envelope. The envelopes were sorted according to these numbers, beginning on Census Day, April 1. Any envelope on which an ED number was not visible was bundled separately and sent directly to the census district office; any green census envelopes were sent to the Jeffersonville, Ind., address shown on these envelopes. (Special green return envelopes were used in a national sample of the mailing pieces in order to measure the return rates and quality of completed questionnaires, and thereby estimate the census followup workload.)

As instructions differed for delivery of returned questionnaires to centralized and decentralized census offices, post offices were advised on March 16, 1970, as to how many and which type(s) of office(s) they served, and were given appropriate instructions. If more than one census district office was involved, it was necessary to sort the questionnaires first by ZIP codes of the return addresses and then by ED numbers.

After the questionnaires were sorted for the decentralized offices, they were bundled by ED and bagged for delivery to census training sites where followup enumerators were being instructed. In addition, the Post Office delivered certain instructional material along with the sorted questionnaires, all of which were to be dispatched in sufficient time to allow for delivery between 8:30 a.m. and noon on April 8.

Questionnaires were delivered to centralized offices at periodic intervals beginning April 1 or 2, after the final sort by ED, ending at such time as the volume of mail diminished to the point where sorting was no longer required. From then on questionnaires were delivered unsorted.

This sorting operation was assigned to the Post Office because it had the equipment, space, and experienced personnel to perform a mail sort of this magnitude efficiently and economically. A considerable amount of time was required for postal personnel to set up the sorting operation. It usually required two sets of cases, one set for a primary and one for a secondary sort, consisting of approximately 12 cases each, for which labels had to be made.

While there were some delays in the sorting and delivery operation, most were due to misunderstanding of instructions or to insufficient communication between the Census Bureau and the Post Office. No standardized procedural methods could be given the Post Office for performing the sort, as each facility had different equipment and space allotments for the work, and the accuracy and timeliness of delivery varied among the post offices across the country. The Census Bureau paid the Post Office Department approximately $4.3 million for postage and contractual services in the mail-out/mail-back areas.

This amount included the services necessary to case and deliver the mailing pieces, to prepare blue cards for missing pieces, and to sort and return the completed questionnaires to the Bureau's designated field locations.

Conventional Census

Organization and preparation.--Households in rural areas and in smaller cities received unaddressed questionnaires which the respondents were asked to complete and hold for a census enumerator's visit. This was called the "conventional" (or "nonmail") census procedure, and the Post Office designated the areas enumerated in that manner as "unaddressed areas" for delivery purposes. (See map on p. 20).

Except for those States that were enumerated entirely by conventional procedures, a type-of-service report form was used to determine which post offices would deliver unaddressed questionnaires. This form was completed by all other post offices in July 1968 and showed which counties of which States each served (see p. 21). Special versions of the form were required for Maryland, Virginia, and Missouri, as these States contained independent cities, and for Louisiana because of its division into parishes instead of counties. (This form was also used to determine the amount of supplies to be sent to each post office.)

On February 18, 1970, postmasters in the 50 States and Puerto Rico received their own instructions and those for their delivery personnel, which they distributed by March 25. (The conventional type of enumeration was extended to certain portions of Puerto Rico, where 41 of the post offices were informed that only those carriers serving city delivery routes would participate in the conventional census. Special versions of the instructions for postmasters and supervisors and for city delivery letter carriers were printed in Spanish.).

Questionnaires arrived at post offices by March 23 in cartons of from 50 to 1,000 each, addressed "Postmaster." Post offices with stations or branches dispatched an adequate supply of questionnaires to each delivery unit in time for March 28 delivery to patrons. When it was necessary to forward only part of a carton, postmasters separated the contents into bundles of questionnaires and placed a label describing the contents on each bundle.

In addition, sectional centers were equipped with reserve supplies of unaddressed questionnaires for distribution to any postmasters who exhausted their initial supplies. If the sectional center could not fill these additional requests, the regional census coordinator was notified.

Delivery.--Carriers were instructed to leave a questionnaire for each household at each dwelling location they served, and postal employees delivered them to all general delivery and lockbox patrons (see below). The Post Office Department did not experience any significant difficulties delivering the questionnaires in rural areas, and there were few shortages of questionnaires.

In Puerto Rico, each city delivery carrier delivered an unaddressed questionnaire to each family or dwelling location on his route, to be collected by an enumerator. Questionnaires were distributed to lockbox and general delivery patrons' homes only at the patrons' request.

Post offices in Alaska delivered questionnaires only in the more populated areas. (In remote villages, enumerators began taking the census directly as early as January, because in April and May ground conditions made travel difficult in those areas.)

Lockbox and window delivery personnel in all other conventional areas were instructed to put a questionnaire in the box of each lockbox patron whose address was in an unaddressed (conventional) area on March 28, and to give one to each window delivery and general delivery patron who called for mail that day. Then, through April 4, clerks asked all other patrons whether they had received a questionnaire, and gave one to any patron who had not or who was unsure of whether he had received one, provided he lived in an unaddressed area.

The Census Bureau paid the Post Office Department $920,000 to deliver 23 million unaddressed questionnaires.

Post-Enumeration Post Office Check (PEPOC).--From mid-May through July 1970, a Post Office check was conducted in conventional districts of 16 Southern States (all of Mississippi and South Carolina, and parts of Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, North Carolina, Oklahoma, Tennessee, Texas, Virginia, and West Virginia) in an attempt to account for families missed during the regular enumeration. (An analysis of the households missed in the 1960 census had indicated that housing-unit coverage problems were most heavily concentrated in the South.) This operation added almost 500,000 persons in approximately 170,000 housing units to the conventional-area population in the South, an increase of approximately 1.4 percent.

A specific report form again was used to determine which post offices would be involved, what types of service (city delivery, lockbox, etc.) each offered, and how many families were served by each type. In addition, this report provided the approximate number of employees in each of the various work categories--carriers, box clerks, etc.--that would be involved in the PEPOC.

The Postal regional bulletins were used to alert postmasters of the forthcoming check. Post offices located on State borders (e.g., in Pennsylvania, Kansas, Missouri, and New Mexico), although not located in regions covered by the check, performed the postal check for families living on their delivery routes in adjacent Southern States which were included in the PEPOC.

In preparation for the check, census enumerators in PEPOC areas completed a white card, Form D-160, "Address Card for Postal Check," (see fig. E), for every housing unit they visited. These were dispatched to postmasters from mid-May to June for distribution to delivery units.

Within one week of receiving the address cards, postmasters began the check (except in those cases where the address cards were sent to the wrong post offices).

Figure E. Form D-160, Address Card for Postal Check

1. ED No.

2. Serial No.

3. Name of head of household ☐ Vacant

(First) (Middle initial) (Last)

FOR POST OFFICE USE

☐ There is no such address as the one shown.

☐ The address shown is deliverable but I do not recognize the name. To the best of my knowledge, the name of the family living at this address on April 1, 1970, was

4. Address

5. Post Office and ZIP code

GPO : 1969—o48—16—80365-1 334-713

FORM D-160 C (12-24-68)

U.S. DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS

ADDRESS CARD FOR POSTAL CHECK

Nonmail Areas

19th Decennial Census — 1970

For all post offices with city delivery carrier service, the address on the white address cards was usually a house number and street name, even for families who preferred lockbox delivery. However, when a post office box number appeared, the postmaster gave the card to the carrier on whose route the patron lived. If a name was entered, but no residential address was available, the card was considered adequate for checking purposes.

At offices with rural delivery but no city delivery service, lockbox and window-delivery clerks completed blue cards for every lockbox and general delivery family that was missed. When there was no carrier delivery the clerk prepared a blue card, Form D-711 (similar to the Form D-702 "blue cards" used in the mail census--see p. 23), for any family missed, copying the entries for items 1 and 2 (ED number and serial number) from the white card for a nearby family.

After the lockbox and general delivery check was complete, the white cards and completed blue cards were passed to the carrier who would normally deliver to the home addresses listed for lockbox and general delivery patrons. After casing these forms with those for families who normally received carrier delivery service the carrier marked all the undeliverable cards as "nixies." He also tore the corners off (instead of filling in the requested information) those white cards on which it was appropriate to mark the lines saying, "The address shown is deliverable but I do not recognize the name."

In addition, rural carriers discarded any blue cards they received for which there was a completed white card. Then the carrier examined his case to see if he had either a white card or a completed blue card for every residential family on his route. For each family the census enumerators missed, the carrier filled out a Form D-711 blue card, copying items 1 and 2 from a white card for a nearby family, and inserted the blue card in its proper place in his case. He then removed the cards with torn corners and bundled them separately. The remaining white cards, representing addresses that the census did not miss, were labeled "verified," and all three bundles were given to the supervisor.

The supervisor discarded all verified cards along with excess supplies. Blue cards, "nixies," and white cards with torn corners were all sent to Jeffersonville. (For PEPOC processing and results, see chapter 8.

The Census Bureau paid the Post Office Department $366,900 to perform the check and $59,700 for postage.

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APPENDIX

Supply Kits Assembled at the Bureau's Jeffersonville Facility

1. Supply kits for district offices by type of data-collection procedure:

Description	Conventional		Decentralized		Centralized	
	Kit No.	Quantity	Kit No.	Quantity	Kit No.	Quantity
Types of kits, total	(X)	14	(X)	12	(X)	12
Number of kits, total	(X)	188,884	(X)	165,253	(X)	48,687
Office supplies and equipment from GSA (General Services Administration)	1	181	101	167	201	45
Office supplies not available from GSA	2	192	102	168	202	46
Manuals	3	186	103	168	203	46
Training guides	4	185	104	174	204	50
"D" series office forms:						
Same quantity for each district office	5	185	105	167	205	48
Different quantity for each district office	6	190	106	168	206	45
Administrative series forms	7	196	107	172	207	55
Envelopes and address labels (sizes "A" - "H")	8	189	108	172	208	47
Crew leader's portfolio	9	6,014	109	6,067	209	2,180
Crew leader's notebook of forms	9A	6,000	109A	5,630	209A	2,200
Enumerator's portfolio	10	83,220	110	71,500	210	20,625
Enumerator's supply of questionnaires	11	51,800	111	80,700	211	23,300
Enumerator's supply of questionnaires--Southern States	11S	40,046	-	-	-	-
Enumerator's supply of questionnaires--Alaska	11A	300	-	-	-	-

2. Supply kits for 12 regional offices and one area office, one each of five kits, A, B, C, D, and E .....65 kits

3. Supply kits for self-enumerating places and for agencies handling census materials:

Description	No. of kits
Total number of kits	2,904
Adult education agencies	8
International airlines (Form D-27, Overseas Travelers' Report)	29
Post offices (materials for processing Form D-160, Address Check)	84
Prisons	417
State hospitals	30
U.S. Air Force (Form D-23, Overseas Census Report)	248
U.S. Army and Coast Guard	844
U.S. embassies (Form D-23)	47
U.S. military installations (Form D-23)	109
U.S. Navy (mail-out questionnaires)	927
Veterans Administration hospitals	161

4. Supply kits for the 1970 Census of Puerto Rico:

Description	Kit No.	Quantity
Total number of kits	(X)	13,422
Office supplies	(X)	7
Administrative forms	7PR	7
Administrative forms	7APR	1
Envelopes and address labels	8PR	7
Crew leader's portfolio	9PR	400
Crew leader's notebook of forms	9APR	400
Enumerator's portfolio	10PR	5,100
Enumerator's supplies--rural	11APR	2,300
Enumerator's supplies--urban	11BPR	2,800
Rural enumerator's supplement	11CPR	2,400

Note: Total number of different kits assembled was 38. Total number of kits assembled was 402,824.
X Not applicable.