

MONSANTO CHEMICAL COMPANY
PLASTICS DIVISION
SPRINGFIELD, MASSACHUSETTS

OPALON-ULTRON PLANNING GROUP
OPERATING MANUAL

April 30, 1953

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OPALON-ULTRON PLANNING GROUP

OPERATING MANUAL

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INTRODUCTION

1. Survey Authority

This operating manual has been prepared as a part of a general survey of the Opalon-Ultron Planning Group conducted by the writer in response to an initial request by Mr. G. T. Barks, Manufacturing Superintendent, and authorized by Mr. R. M. Morris, Plant Manager, on November 25, 1952.

2. Purpose

The purpose of this manual is to provide a detailed description of the procedures and policies governing the conduct of production planning activities in the Opalon-Ultron area. Since such matters are not static, nothing in this manual is to be construed as limiting in any way the future substitution of improved methods or policies upon approval of the proper authority.

3. Scope

Specifically, this manual covers the operation of the Opalon-Ultron Planning Group only, with occasional reference to Sales, Shipping, and Accounting Department functions which directly affect Planning. Also included is a description of the clerical cost control system developed during this survey as an aid to evaluating the clerical workload of the Planning Group.

4. Responsibilities

a. The Planning Group is responsible for:

- 1) Proper production scheduling.
- 2) Routine processing of orders.
- 3) Determination of shipment promise and re-promise dates.
- 4) Maintenance of necessary files and records.
- 5) Availability of current inventory and open order status in detail.
- 6) Expediting of production and shipments as required.
- 7) Issuance of periodic reports pertaining to planning and production activities.
- 8) Maintaining continuous contact with Sales, Production, and Shipping in order to act as a focal point for current information regarding production, inventory, and shipment status.

b. The Sales Department is responsible for:

- 1) The expediting of customer orders to the Planning Group.

- 2) The supplying of complete instructions to the Planning Group regarding specific customer requirements for material.
 - 3) Knowledge of market demand for the various specific products, and assignment of priority to individual orders for purposes of production scheduling.
 - 4) The determination of specific items and quantities to be produced for inventory.
 - 5) The designation of product specifications for use as criteria for shipping purposes.
 - 6) Furnishing Planning each month, prior to an established deadline, with the best possible forecast of complete production requirements, by formulation, for the coming month for use in preparing the raw material forecast.
- c. The Shipping Department is responsible for:
- 1) The shipment of orders as scheduled by the Planning Group.
 - 2) The prompt notification to Planning of any scheduled shipments which are to be delayed as soon as such information becomes available.
 - 3) The provision of reasons for the delay of any items not being shipped as scheduled.
- d. The Production Department is responsible for:
- 1) Adherence to the production schedules issued by the Planning Group.
 - 2) The prompt notification to Planning of any failures to meet production schedules as soon as such information becomes available. This includes notification of the date and duration of all trial runs, etc., which may affect production schedules. Reasons shall be given in all cases.
 - 3) The proper taking and delivering of test samples to a designated pick-up point in accordance with the established schedule.
- e. The Plant Accounting Group is responsible for:
- 1) Cooperation with the Planning Group with regard to production, shipment, and inventory figures and information essential to the maintenance of accurate and up-to-date planning records. At present, close contact between these two groups is essential in order to promote the proper exchange of mutually-

needed information, and to reduce duplication of work to a minimum.

- 2) The provision of weekly raw material inventories and usage reports to Planning.

f. The Plant Laboratories are responsible for:

- 1) The prompt pick-up of test samples from designated points in accordance with the established schedule.
- 2) The transmission of test results for those characteristics which affect shipping to the Planning Group by 3:00 P.M. each day, or by such other time as may be agreed upon through negotiation.

5. Organization

The Planning Group reports to the Manufacturing Superintendent, through the Operating Superintendent of the Opalon-Ultrion Production area.

The group's personnel is divided into three positions with duties and responsibilities as outlined below:

Position 1: Chief Planning Clerk

This individual is in direct charge of all operations of the Group, and is responsible for all actions performed by the Group. His specific duties are as follows:

- a. Receives all orders and assigns promise dates for shipment in accordance with established procedure. Also issues repromise reports daily.
- b. Develops operating procedures and policy proposals when necessary, and reduces these to writing for approval by higher authority.
- c. Is contact man for the group on all matters concerning the relations of the Group with other groups or departments, and on all procedural or policy matters affecting the Group.
- d. Is responsible for the proper performance of all functions of the Group, as outlined in paragraph 4a. above, and for the prompt reporting to higher authority of any and all conditions which may arise to prevent proper performance and which are beyond his power to correct.
- e. Supervises and assigns work to the other members of the Group (Positions 2 and 3) with due regard to proper balancing of the workload, and following the principle that all possible work of a routine clerical nature should be assigned to Position 3.

Position 2: Assistant Planning Clerk

The individual, or individuals, in this position work under the direction of the Chief Planning Clerk. The primary function of this position is that of expeditor, with specific duties and responsibilities as outlined below:

- a. Maintains close contact with such groups as the Order Department, Research, Technical Service, Production supervision, Warehouse personnel, Shipping, Traffic, etc. in order to keep currently informed on the status of specific items which may require special attention by Planning or by any of the other groups involved.
- b. Acts as expeditor on special items, and keeps those concerned, including the Chief Planning Clerk, informed of their current status.
- c. Prepares shipping schedules, participates in production scheduling meetings, prepares periodic reports, and performs such other duties as may be assigned by the Chief Planning Clerk.

Position 3: Clerk

This position handles all routine clerical work of the group under the direction of the Chief Planning Clerk. Specific duties are as follows:

- a. Maintains current inventories on all product items.
- b. Maintains open order records.
- c. Keeps records of production and applicable test results.
- d. Determines raw material requirements for current production, and prepares the necessary requisitions to insure an adequate supply within the production area at all times.
- e. Prepares the monthly Raw Material Forecast.
- f. Assigns blend numbers, and issues Packout, Blender, and Banbury schedules.
- g. Distributes order copies according to established routine.
- h. Performs all routine filing operations.
- i. Prepares special analyses, reports, etc. as may be assigned by the Chief Planning Clerk.

II. PROCESSING OF ORDERS

1. General Procedure

The regular routine for processing orders and releases is shown in Flow Chart No. 1, Appendix A. This chart is largely self-explanatory except for the symbols and color codes which are identified in the key given on the tabbed title sheet for Appendix A.

2. Shipment Promise and Re-promise Procedure

The current procedure and policy regarding the establishment of promises and re-promises is covered in the bulletin given in Appendix B. This procedure was made effective as of April 1, 1953.

3. Sample Order Procedure

Sample orders are ordinarily received by mail on Form No. 270, but may be teletyped if urgent. The procedure is somewhat different from that for regular orders, and is outlined as follows:

- a. A promised date is entered as on the regular orders.
- b. The copies are distributed as follows:

Original and copies 3 and 4 - To the Color Lab Supervisor or Sampleman.

Salmon (No. 2) - Retained in Planning open order file according to promise date.

All other copies - To Order Department.

- c. The sample is obtained from the sample room and delivered to the Parcel Post Department with the original copy of the order by the Color Lab Supervisor. At the same time the yellow copy is returned to Planning.
- d. If the desired sample is not available in the sample room, a Material Handling Requisition (Form No. 433) is initiated to move a roll from inventory to the sample room.
- e. Planning pulls and destroys the salmon copy, and files the yellow copy in the "completed" file.
- f. It is to be emphasized that Planning is still responsible for follow-up on sample orders to ensure their shipment on or before the date promised. If delays are encountered, the reasons therefore must be obtained from Production, and a re-promise issued in accordance with standard procedure.

4. Shipping Schedules

Shipping schedules are prepared daily for each product. In order to insure that no orders are over-looked, the practice has been established of reviewing all open orders each day. It is imperative that the schedules be completed at 3:30 P.M. in order to provide Shipping with time for planning the following day's activities and to arrange for carriers.

5. Expediting

Since definite limitations on routine shipping service have been established in order to smooth out normal operations (see Appendix B.), it has consequently become even more important that those items of genuine urgency be expedited to the fullest possible extent. The responsibility for such expediting rests directly with the Planning Group. It is expected that Planning will carefully relay all requirements and information regarding items of an urgent nature to the concerned parties without delay, and will follow-up to insure proper completion of the desired action. In cases where Planning is unsuccessful in obtaining the desired action, or if success is doubtful, it will be Planning's responsibility to inform the party from whom the request for special handling originated so that he may be in a position to take additional action if deemed necessary.

III. TRANSFERS

1. Transfer of Film to Sheet Department

- a. The Sheet Planning Group obtains information regarding the availability of desired items by telephone from the Vinyl Planning Group.
- b. A Material Transfer Requisition (Form 433) is initiated by Sheet Planning, and is mailed to Vinyl Planning.
- c. Vinyl Planning issues written instructions to the Shipping Department warehouseman to place the desired rolls at the loading platform, and forwards the Transfer Requisition to the Materials Handling Foreman.
- d. The rolls are picked up and delivered to the Sheet Department by a Materials Handling truck. Two copies of the case tickets are removed when the material is loaded, and are distributed as follows:

One copy to Vinyl Planning (With a signed copy of the requisition).

One copy to Sheet Planning when material is delivered.

- e. The requisition and tickets are forwarded from Vinyl Planning to Plant Accounting for the information of that group.

2. Transfers to Bondsville Warehouse and to Public Warehouses

Complete procedures for these types of transfers are covered in the bulletin given in Appendix C.

IV. PRODUCTION SCHEDULING PROCEDURE

1. Monthly Scheduling Meetings

- a. Each month meetings will be held to determine the best possible production schedule for each product for the coming month. These meetings are to be attended by representatives of the:

Product Sales Manager
Order Department
Production Supervision
Planning Group.

- b. The above meetings will be held not later than four days before the end of the month, and in no case less than four days before the runout date of the current schedule if this precedes the month end. A definite date should be set at each meeting for holding the following month's meeting.

The most convenient time for these meetings from the standpoint of Planning, is at 11:00 A.M. on Tuesday, Wednesday, or Thursday.

- c. Even though definite orders may not exist to cover the entire month, it is imperative that the full month be scheduled for the purpose of preparing the Raw Material Forecast. If specific orders are not available, a forecast by formulation must be supplied by the Sales Department for any unscheduled portion of the month.
- d. Planning is responsible for issuing copies of the production schedule, and all revisions thereof, to the following concerned parties:

Assistant Product Sales Manager
Sales Correspondent (temporarily)
Technical Service Office (temporarily)
Manufacturing Superintendent
Operating Superintendent
Operating Supervisor - Film & Compounds
Operating Supervisor - Color Laboratory
Foremen's Office
Shipping
Planning

In addition to the monthly schedule meeting, there will be a weekly review of the schedule for the coming week. Normally, this review will simply be in the form of a telephone conversation between the Sales Correspondent and the Planning Clerk, and will be accomplished on Thursday in order to tie in with the shipment promise procedure outlined in Appendix B. At this time, the production schedule for the coming week (Monday through Sunday) will be "frozen" against all Sales breaks except those of a most urgent nature. All such emergency deviations will require the approval of the Product Sales Manager and of the Manufacturing or Operating Superintendent.

Planning will publish the weekly "frozen" schedule on Friday for prompt distribution to all concerned.

2. Economical Scheduling of Film

a. Production Sequence

There are a great many factors which govern the economical scheduling of individual product items. It is, therefore, important that all possible consideration be given to the scheduling of production items in the sequence which will best minimize the costs involved. While less economical sequences may be dictated by customer priority requirements, it is the responsibility of Planning, in conjunction with Production Supervision, to bring the approximate cost of such deviations to the attention of the Sales Department so that proper evaluation of their desirability may be made. Specifically, the following factors shall be given consideration:

Color Changes
Gage Changes
Formulation Changes
Width Changes
Embossing Changes

These factors differ in their relative importance. Assuming that the average cost of one hour of down time is \$80.00, the approximate costs of the various types of changes are given in summary form in Appendix F. It should be noted that the costs of two or more types of change are not cumulative if they are performed at the same time. In such cases the cost is determined by that of the longest single operation only. Analysis of this cost summary indicates that the following general rules should be observed in production scheduling:

- (1) Color sequences should be followed without interruption in order to minimize cleanout expense.
- (2) Formulation changes which involve a radical shift from one heat range to another should be minimized. In this connection, the running speed (a function of gage) must also be taken into consideration. In general, the currently-used formulations are divided as follows:

Low Temperature: UL-1, 2, 6, and 7.

High Temperature (Stiff): UL-3, 4, 5, P82-50, and P82-51.

- (3) Gage changes between the heavy and light ranges should be kept to a minimum, based on the following dividing line:

Light: .003 to .006

Heavy: .006 to .010

b. Run Length

While production sequence is of great importance in scheduling, the factor of run length should actually receive primary consideration due to its even more significant effect on costs. Any overall guide to economical scheduling must therefore take this factor into account along with the sequence variables. Such an overall guide has been developed, and is described in detail in Appendix I. Briefly, the system is based on three fundamental steps:

- (1) The establishment of an acceptable production standard for the cost of item changes per pound produced.
- (2) The evaluation of each week's schedule prior to "freezing" (See Paragraph 1-d. above) to determine the approximate cost per pound of the changes contained therein for comparison with the standard.
- (3) If the cost of the proposed schedule is appreciably greater than standard, the negotiation of schedule revisions to reduce the cost to an acceptable level.

This system can be effectively employed only with the sincere cooperation of both Production and Sales, but if a conscientious effort is made substantial savings in production cost should result.

3. Production Run Schedules

Based on the production schedules derived as described above, Planning issues blend numbers, tickets, and schedule sheets for each production run in accordance with the procedure shown in Chart No. 8, Appendix A.

V. RAW MATERIAL PLANNING

1. Raw Material Forecast

Planning is responsible for submitting a monthly forecast of raw material requirements to the Material Coordination Group. The deadline for this forecast is noon of the 5th day of the new month, but the goal for Planning should be the 1st, if at all possible.

The forecast must give not only the requirements for the coming month, based on the established production schedule, but must also indicate anticipated requirements for the two months following- making three months in all. This is necessary in order to give sufficient lead time to insure the availability of materials when needed.

In view of the fact that production is only definitely scheduled for a month ahead, this means that Planning must estimate the requirements for the second and third months on the basis of the current pattern of production according to formulation. Planning will, therefore, maintain a running record of monthly production by formulation in order that trends may be observed. This should be reviewed with Sales at the time of the monthly scheduling meeting in order to obtain whatever long-range information can be obtained from that quarter.

The detailed clerical procedure for preparing the Forecast is given in Flow Chart No. 6, Appendix A.

Planning is further responsible for the immediate reporting, in writing, to Material Coordination of any changes in forecast which may result from production schedule or formulation changes during the month.

2. Raw Material Usage Record

A simple check against possible raw material shortage is maintained by the Planning Group. This is kept on the basis of weekly inventory and usage reports supplied by the Plant Accounting Group, and is checked by the Chief Planning Clerk after each posting to ensure that no critical items have developed. Under current operating conditions, such cases may arise due to the fact that stock levels are maintained at only 30 days' supply, and this quantity might be used up in the first few days of the month if production happened to be concentrated on the particular formulation using a certain critical material. Expediting action by Planning through Material Coordination is indicated in such cases in order to bring the inventory up to a safe level as soon as possible.

3. Raw Material Requisitioning for Current Needs

Storage space for raw materials in the Ultron Warehouse and production areas is presently so limited that a day-to-day

check must be made by Planning to be sure that sufficient quantities are requisitioned from primary storage areas and delivered by the Transportation and Materials Department to keep Production supplied. For this reason, the procedure shown in Flow Chart No. 7, Appendix A, is followed at the present time.

When adequate storage space is available so that the building inventories can be maintained on a "maximum-minimum" basis, this procedure can, of course, be largely eliminated.

VI. PLANNING RECORDS

1. Inventories

- a. Ultron Film - The Springfield portion of the inventory record will consist of a daily IBM tabulation in summary form (i.e.: The total pounds of each product item will be consolidated in a single line item on the tabulation). The outside warehouse (Bondsville) portion will be identical except that the tabulation will be run less frequently, depending on the turnover rate. Currently, a weekly run off is satisfactory.

Since certain items have defects which prevent their use by certain customers, even though they are classified as first grade film, it is necessary that these items be broken down in the tabulation by means of the coding system which appears in Appendix D. Further, in order to provide a complete record of the nature of the defects, roll numbers involved, etc., it will be necessary for Planning to maintain a ledger sheet for each of these items giving this information for reference purposes.

The card decks for the inventory will be maintained by the Plant Accounting Group and by the Bondsville Warehouse Group, respectively. The Planning Group, through daily checking of production and shipment entries, will assist in maintaining accuracy, and will cooperate to the fullest extent in bringing any necessary adjustments to the attention of both parties.

- b. Compound and Dry Blend Inventories

Eventually, these inventories will be handled in a manner identical to that described above for film. In fact, the Bondsville tabulation is currently in use by Planning. However, until such time as the Springfield tabulation can be run on a more frequent basis, the Planning Group must maintain a manually-posted, periodically reconciled, inventory ledger in order to provide the up-to-date inventory information required. If run-offs cannot be obtained on a daily basis, it will still be possible to post shipments and production to the latest tabulation sheet in order to keep the information current until the next tabulation is received. This method will at last eliminate the work of reconciliation, and will be the immediate goal towards which both Planning and Plant Accounting will work.

- c. Opalon Resin Inventory

This inventory is not presently carried on tab cards, but must be maintained manually under current conditions of operation. Due to limited warehouse facilities and the rapid movement of the stock, Planning must keep up-to-the-minute on inventories in order to direct shipments properly.

Furthermore, quality difficulties have meant frequent shifts of stock from one category to another.

For these reasons, Planning maintains an inventory file of the "production", or tissue copies, of the pallet tickets arranged according to location and quality, and in numerical sequence within each category. An exception to this exists in the case of stock in public warehouse for which the tickets are kept in groups according to the lot numbers assigned by the public warehouse to each load received.

A running balance of pounds in each inventory category is kept on the face of the separator cards dividing each category.

2. Production Records

The procedure for summarizing and recording daily production for the various products is shown graphically in the following Flow Charts, Appendix A:

Chart No. 2 - Compound and Dry Blend

Chart No. 3 - Opalon Resin

Chart No. 4 - Ultron Film

It will be noted that in the case of Ultron Film, Planning works entirely from a production summary prepared by Plant Accounting rather than from the original production tickets. This is done in order that the early morning work of summarizing production tickets may be distributed between the two groups with the result that the final figures are available sooner than they otherwise would be.

3. Shipment Records

The procedure for checking and recording shipment information is shown graphically in Flow Chart No. 5, Appendix A. This work is next in priority to that of the production records in the daily work routine.

4. Open Order Records

- a. Compound and Dry Blend - All orders are entered in a single Open Order Record book as soon as received. A sample of the form used appears in Appendix E. The sheets are arranged in numerical order according to formulation. They are kept up-to-date at all times in accordance with the procedure shown in Flow Chart No. 1, Appendix A.
- b. Opalon Resin - The Open Order Record is maintained in the same manner as for Compound except that the sheets are arranged according to quality category.

- c. Ultron Film - In the case of film, Open Order records are maintained in a slightly different manner due to the large amount of clerical work which would otherwise result if all orders were entered in the record. Consequently, only those orders held for customer release are entered on the open order sheets, which are arranged first alphabetically by customer name and then by item description. The Planning copies of these orders are filed in a separate folder in alphabetical order.

To advise order copies are filed in another folder in alphabetical order for reader reference until such time as they are scheduled for production.

Released Orders for which shipment promise dates have been established are placed in a third folder in order of promise date for daily review at the time of preparation of the shipping schedule.

5. History of Product Item Activity

A tabulation of total production and shipments, by product code and item description, is received each month from the Tabulating Department. These figures are posted to record books set up in such a way that the month-to-month activity on each item may be readily reviewed for purposes of production planning and scheduling and for such other purposes as review of inventories, selection of material for transfer to outside warehouses, etc.

6. Planning Files

The principal files, with the required retention period for each, are tabulated below:

<u>Name of File</u>	<u>Retention Period</u>
a. Completed orders	1 year
b. Production Summaries	5 years*
c. Shippers and Tickets	1 year
d. Shipping Summaries	2 years
e. Shipping Schedules	2 years
f. Blender, Banbury, & Packout Schedules	6 months
g. Raw Material Forecasts	1 year

*This period is specified in view of the possibility of discontinuance of the individual roll inventory, in which case the Production Summary would be the only ready source of roll number information.

VII. PERIODIC REPORTS

1. Open Order Status Report

An itemized open order and inventory status report for each product will be prepared monthly immediately prior to the date set for the monthly scheduling meeting. Copies of these reports are distributed to: Production Supervision, Sales Dept., and Order Dept.

2. Monthly Repromise Summary

In this report the total repromises issued during the month will be summarized according to the reasons which necessitated them. Distribution will be to: Production Supervision, Sales Dept., and Order Dept.

3. Other Periodic Reports

A list of the reports covered elsewhere in this manual is given below, for the sake of completeness, with references to the section of the manual in which they are described:

- Daily Shipping Schedules (Appendix A - Chart 1)
- Monthly Raw Material Forecast (V - 1)
- Daily Repromise Reports (Appendix B)
- Weekly Report of Calendar Change-over Cost per Pound Scheduled (Appendix I)
- Clerical Cost Control Reports (VIII - 2)

VIII. CLERICAL COST CONTROL SYSTEM

1. General

A simplified Clerical Cost Control system has been developed as a means for : (1) evaluating the current clerical workload of the Planning Group as a basis for determining the necessary staffing requirements, and (2) providing a continuous measurement of the workload in order to maintain a constant check on group performance and staff requirements.

The first step in setting up this system was to break the various clerical operations into basic steps as indicated on the Flow Charts in Appendix A. It is important to note that only Position 3, or strictly clerical, jobs are included in this control plan. The operations performed by the Chief and Assistant Planning Clerks, Positions 1 and 2 are not readily measurable, and are not included in the plan or in the standards in any way. Each of these operations was then time studied to determine a standard unit time for each. Personal allowance and rating factors were included in the final standards so that they represent the time which should be required by the average operator with normal time off for personal needs, fatigue, etc.

Each of these operations was then related to the production count which best measured the output on that particular operation, and which, at the same time, could be obtained conveniently on a month-to-month basis. A tabulation of the major production counts and their sources as finally established is given in the "Summary of Major Production Counts and Standards", Appendix G.

Also shown in this summary are the so-called "pattern" quantities for each count. These quantities represent the average level of activity over approximately the past four months, and were derived from actual analysis of available office records. Extending these quantities by the standard unit time gives the standard hours of work at the pattern level, and by adding this column the total average clerical workload of the group is obtained (227.07 hours per month). This may be interpreted, dividing by the standard 173 hours per month per person, as indicating that the current clerical workload requires the services of 1.3 average persons.

2. Monthly Performance Report

Each month the Planning Group will submit a control report consisting of the following two sheets:

- A-78- "Monthly Job Summary of Standard Hours"
- A-76- "Office Performance Report"

Appendix H contains completed forms for the "Pattern" month and for the actual month of March, 1953. The method of making the computations involved in these reports is ex-

plained in the following:

a. Monthly Job Summary of Standard Hours (A-78)

1) Measured Workload

The monthly production figures for the 13 major production counts are first obtained and entered in the column headed "Actual Monthly Units" on Form A-78. These figures are then extended by multiplying by the Standard Unit Times, and the products are entered in the column headed "Standard Man Hours". Finally, the column is totalled to obtain the "Total Measured Work", which appears on Line A.

2) Work Related to Measured Work

This item, which appears on Line B, covers that class of work which does not vary in volume with any single production count, but which is more directly related to the general level of office activity as a whole. The computation is performed by multiplying the standard (0.11154) by the figure on Line A- "Total Measured Work".

3) Constant Work

This item, which appears on Line C, covers that class of work which does not vary appreciably regardless of workload. A constant allowance of 16.400 hours per month is, therefore, entered for this item.

4) Total Department Performance

The Standard Hours on Lines A, B, and C are then totalled on Line D. The "Actual Man Hours" are next entered from the "Office Performance Report", on which they are computed as explained in b. below. Finally, the difference between these two figures and the percentage of Standard Hours to Actual Hours is entered in the last two columns as indicated.

b. Office Performance Report (A-76)

1) Hours Paid For

The regular and overtime clerical hours actually paid for are first entered on Lines 1-A and B. "Borrowed" and "Loaned" time is then entered on Lines 1-C and D. The total is entered as indicated.

2) Adjustments

Section 2, Adjustments, is then filled out as indicated, being certain that the figures entered tally with those on the weekly payroll time cards.

3) Net Available Hours

This is simply the sum of the totals of Sections 1 and 2.

4) Standard Hours

This figure is brought forward from Line D of the "Monthly Job Summary of Standard Hours".

The remaining items on the report are self-explanatory.

3. Maintenance of Clerical Cost Control System

In view of the fact that the clerical operations performed by this group will undoubtedly change over a period of time, it will be necessary to make revisions in the standard unit times, and possibly in the production counts, to take such changes into account. This is especially true when new duties are added or old ones are eliminated, although revisions may also be required if methods or procedures are simply revised. In all such cases, the writer, or his successor, should be contacted to make whatever revisions may be needed.

LIST OF APPENDICES

A. Flow Charts (See Tabbed Sheet for Key to Symbols)

- No. 1 - Order Processing
- No. 2 - Compound & Dry Blend Production
- No. 3 - Resin Production
- No. 4 - Film Production
- No. 5 - Shipment Records
- No. 6 - Raw Material Forecast
- No. 7 - Raw Material Requisitioning
- No. 8 - Production Run Schedules

B. Promise and Re-promise Procedure Bulletin.

C. Procedure Bulletin for Transfers to Bondsville and to Public Warehouses.

D. I.B.M. Code for "Substandard 1286 Material".

E. Open Order Record Sheets.

F. Summary List of Costs of Production Changes.

G. Summary of Major Production Counts and Clerical Standards.

H. Clerical Cost Control Reports.

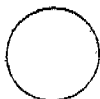
I. Production Scheduling Guide.

APPENDIX A

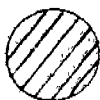
KEY TO FLOW CHART SYMBOLS



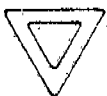
Initial receipt of, or creation of,
a paper work item.



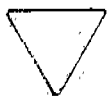
A clerical (Position 3) operation.



An operation performed by other than
clerical (Position 3) personnel.



Temporary file.



Permanent file.



Movement out of department or to
another chart.



Destroy

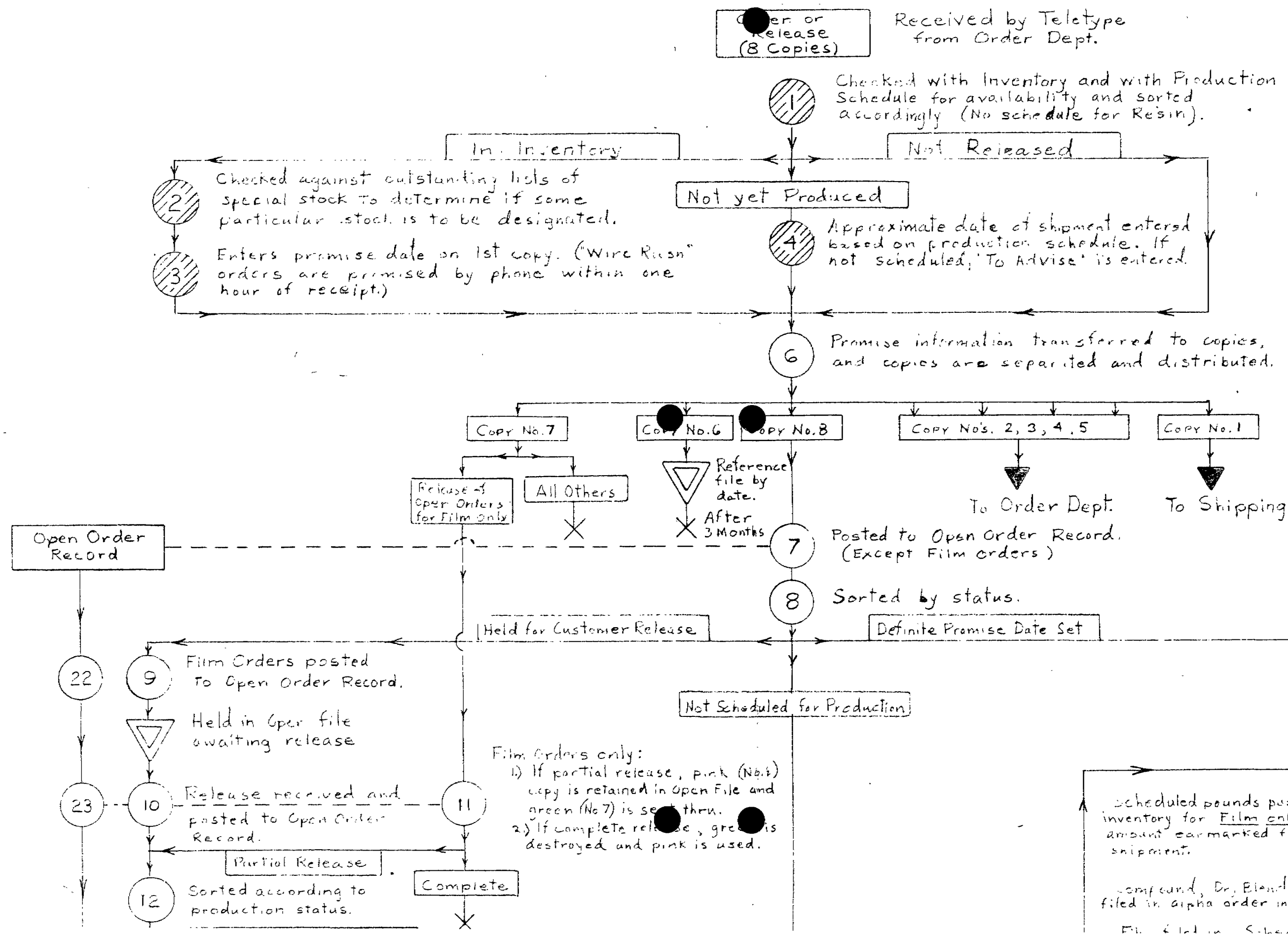


Flow of paper work.

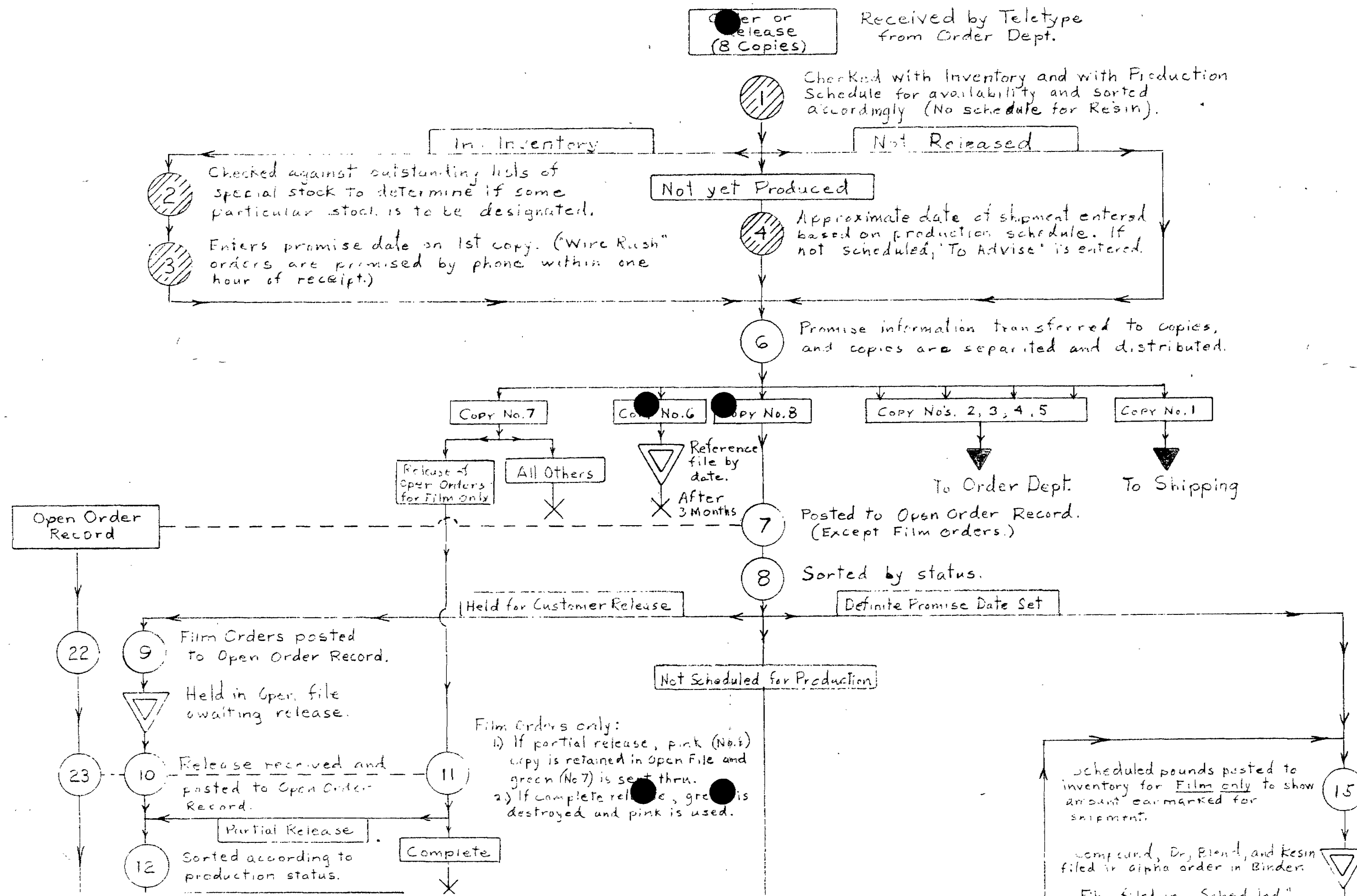


Papers brought together for checking,
posting, etc.

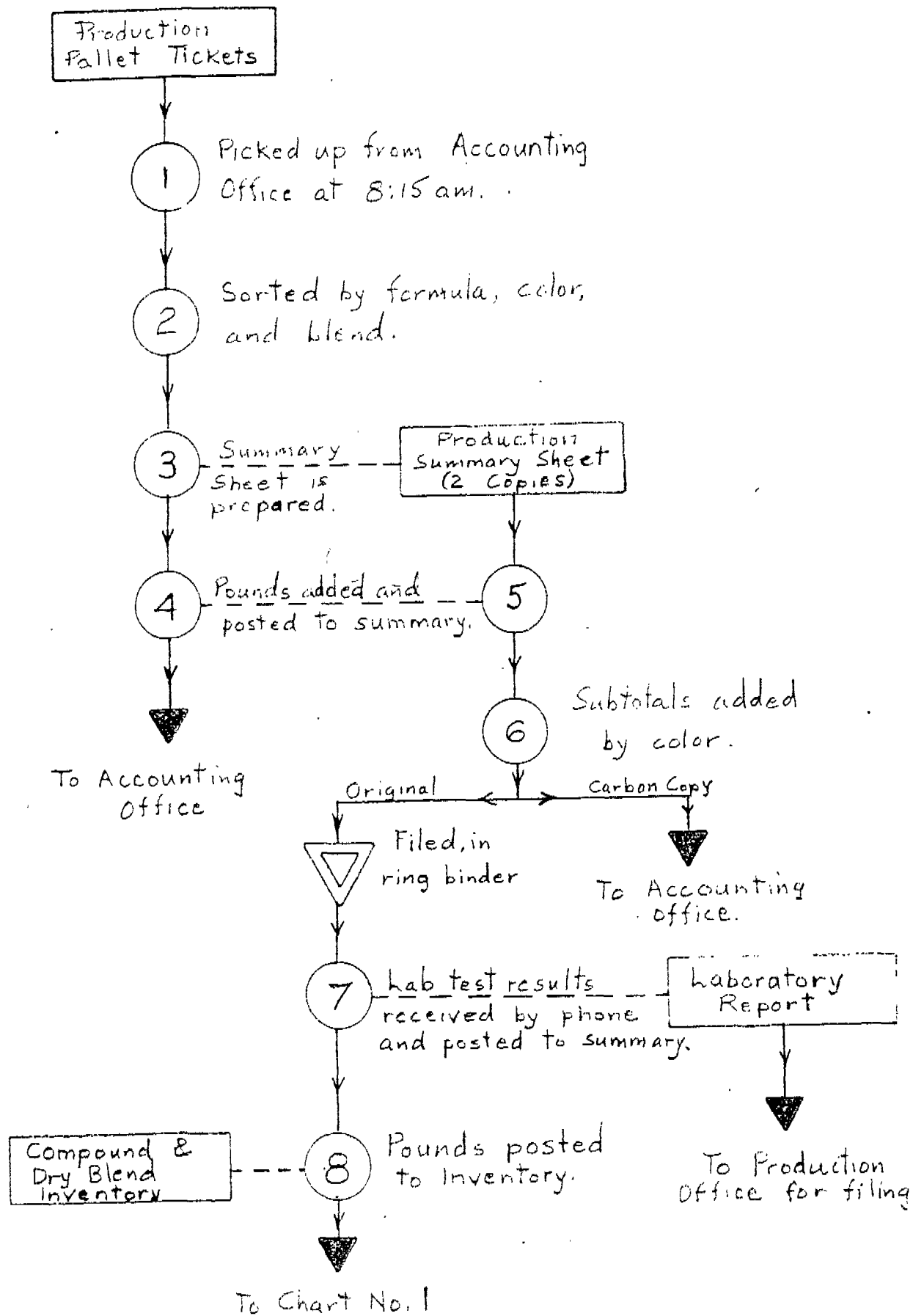
OPALON-ULTRON ORDER PROCESSING

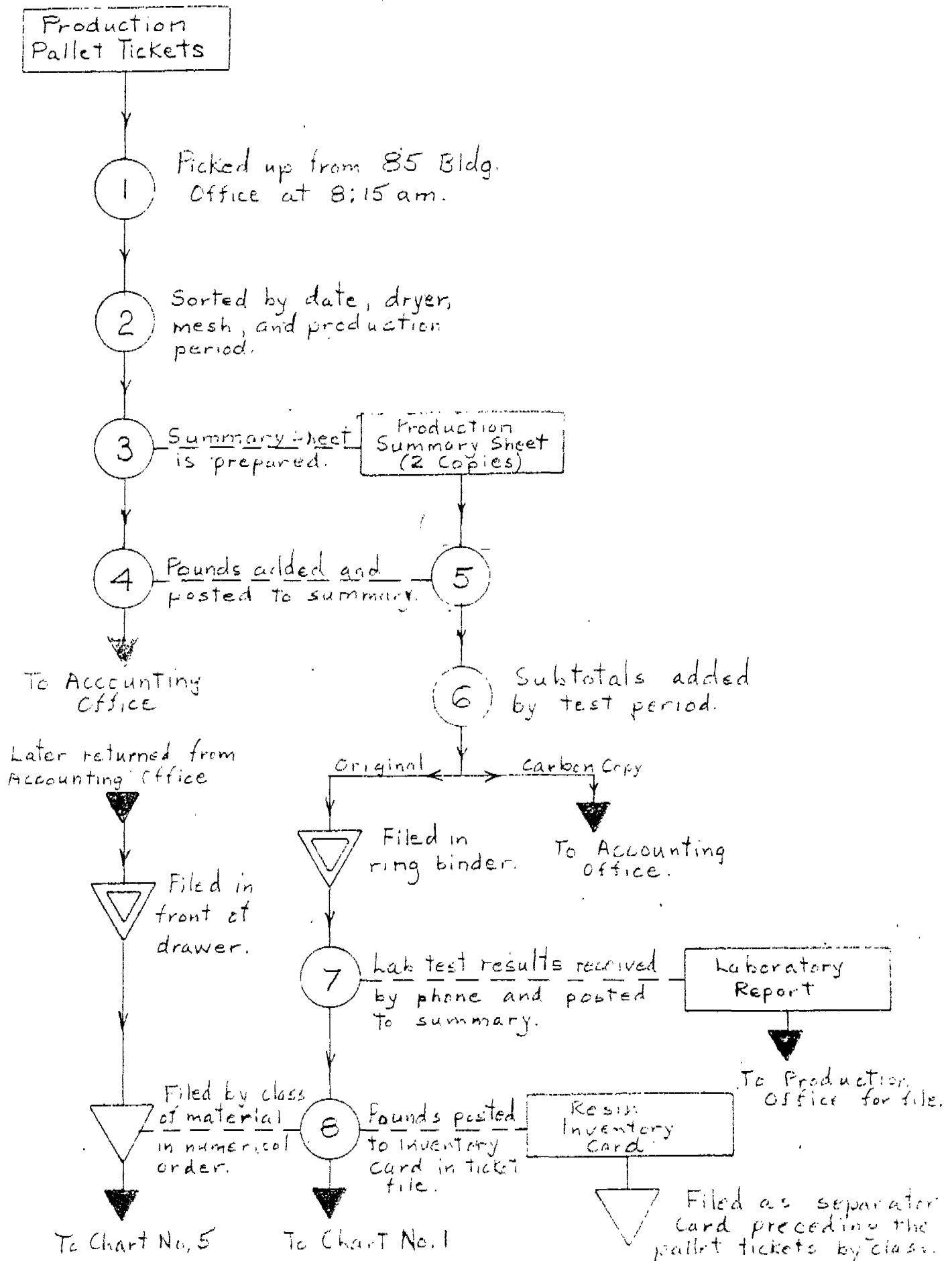


OPALON-ULTRON ORDER PROCESSING

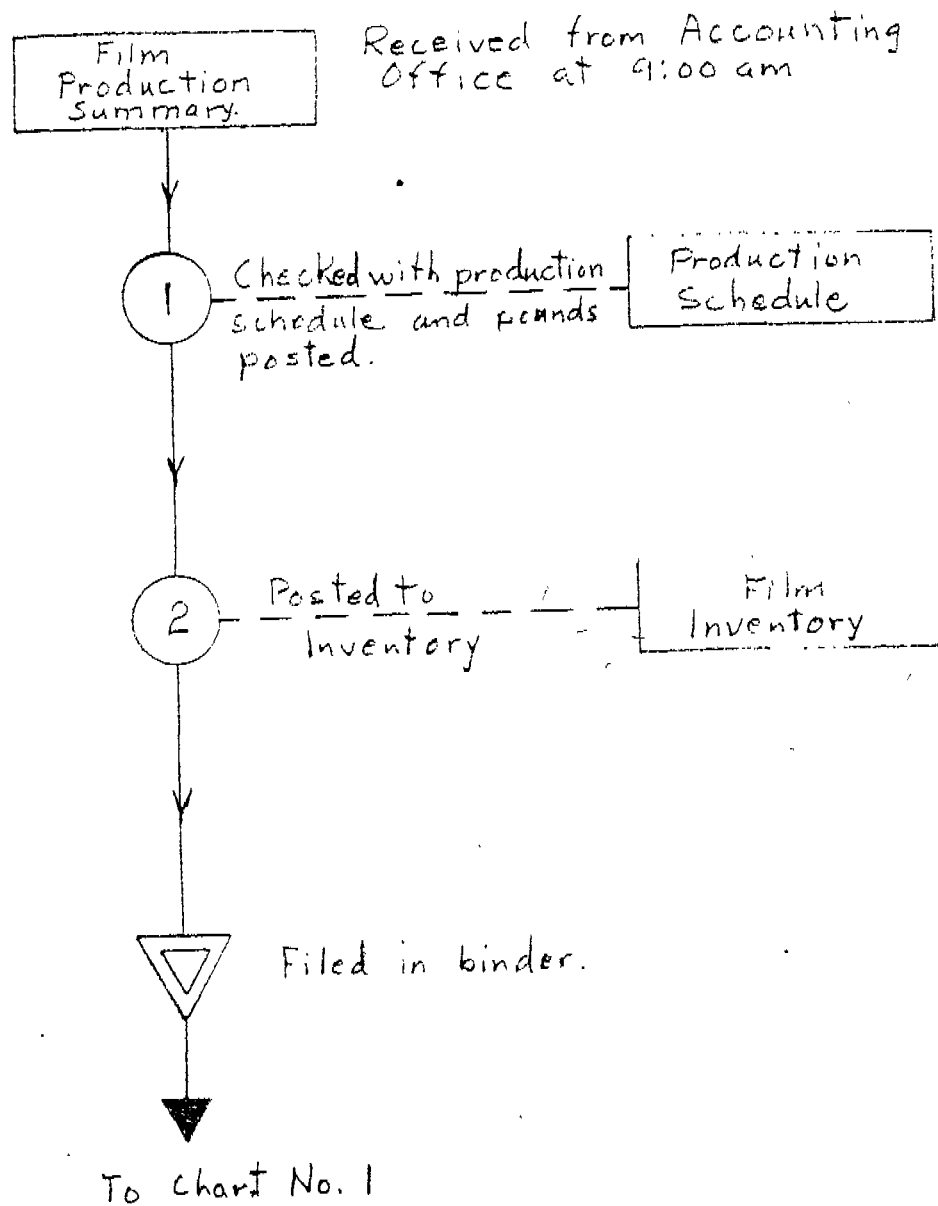


COMPOUND & DRY BLEND PRODUCTION

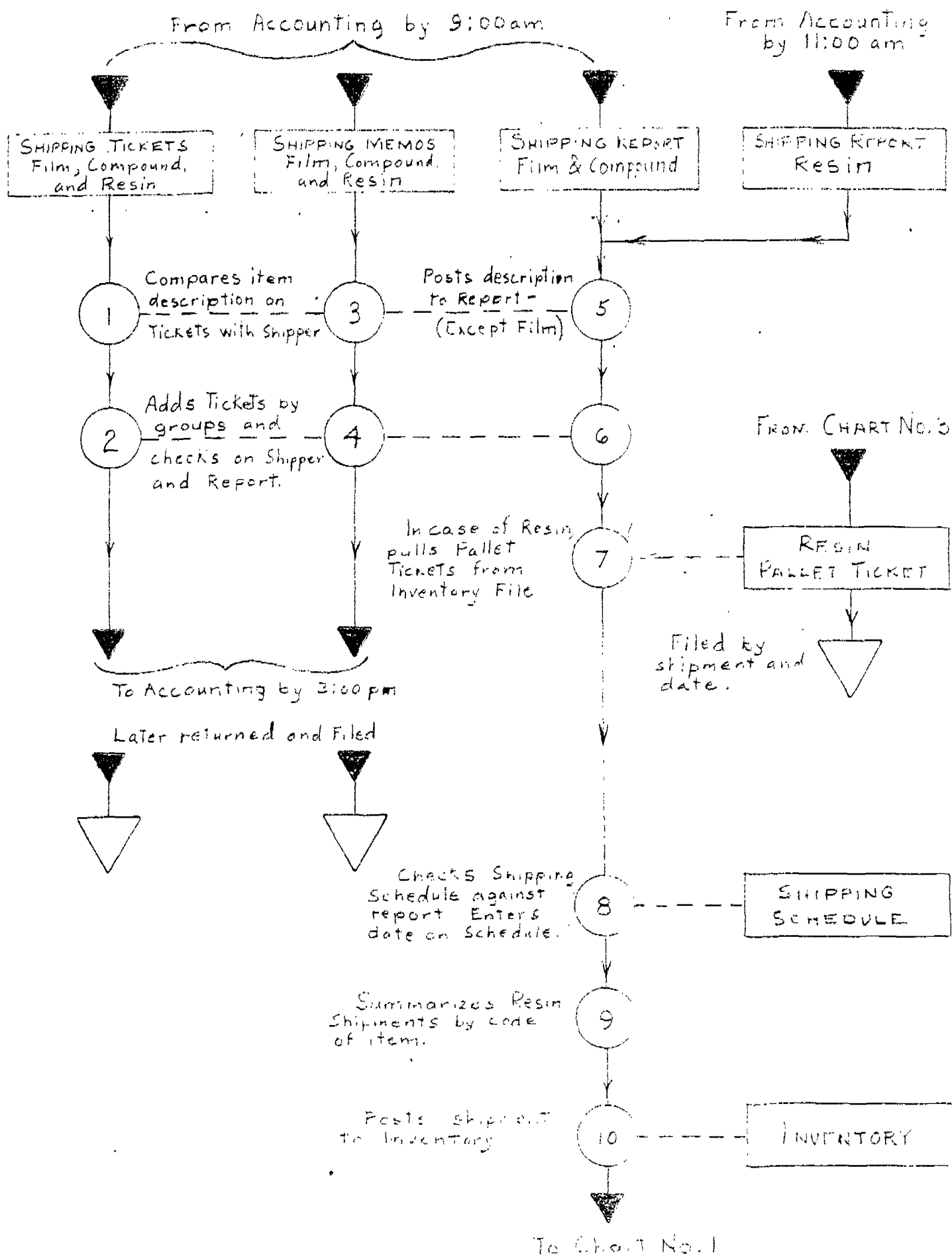


RESIN PRODUCTION

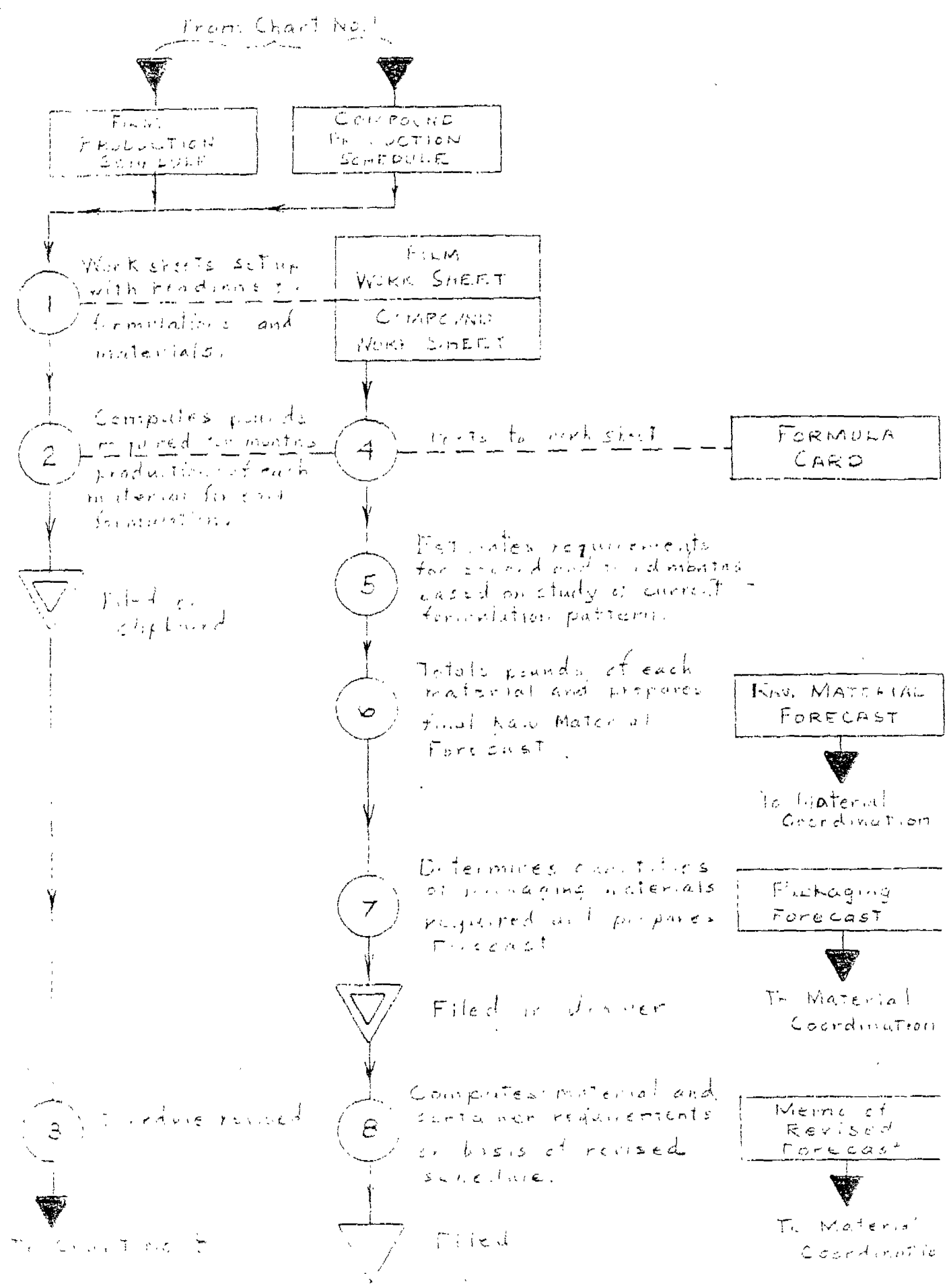
FILM PRODUCTION



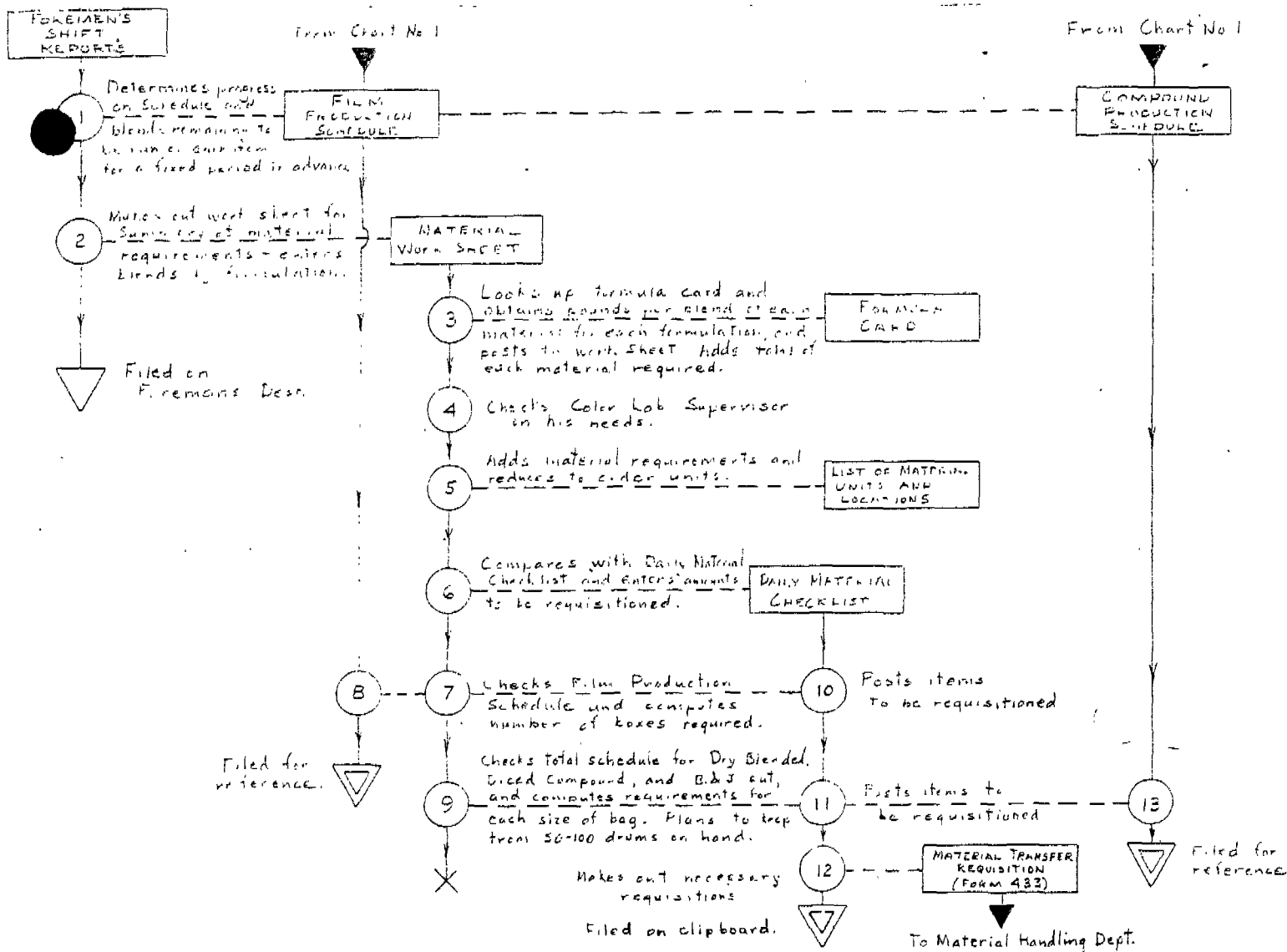
SHIPPING RECORDS - CLERICAL PROCEDURE



RAW MATERIAL FORECAST - CLERICAL PROCEDURE



RAW MATERIAL REQUISITIONING - CLERICAL





April 1, 1953

OPALON - ULTRON PLANNINGSHIPMENT PROMISE AND REPROMISE PROCEDUREA. Original Promises on Incoming Orders and Releases1. Material in Inventory

If material to fill the order is in inventory (tested and approved), shipment will be promised for the following working day, subject to the following conditions:

- a. Orders received after 3:00 PM of a given day will be considered to have been received on the following work day for promise date purposes.
- b. Consideration must be given to the scheduled Shipping Department workload to avoid unnecessary overtime or "bunching up" of work insofar as possible.
- c. Wire Rush orders will be given special handling when their urgency demands it, but must be kept to a minimum. In all such cases, Planning will supply a promise date or status report to the Order Department within one hour after receipt of the order.

2. Material Not Yet Produced

If the material has not yet been produced, it either will or will not be on the production schedule. These two cases are covered in the following paragraphs:

a. Material On Production Schedule

Here again, two cases exist, depending on how soon the material is to be produced.

- 1) If the scheduled date of production is within one week of the day on which the order or release is received a definite promise date will be given.
- 2) If the scheduled date of production is more than one week in the future, the promise date given will be prefixed by a "T" to denote that it is a tentative date. This date will stand, regardless of subsequent changes in the production schedule, until the Thursday of the week preceding the week in which the item is actually scheduled for production. At this time, definite repromise dates for all items scheduled for the coming week will be given through the repromise procedure outlined in Section "B" below.

b. Material Not On Production Schedule

In this case, the order copies will be marked "to advise" and the item will be scheduled for production at the next schedule meeting. As soon as the item is scheduled, a promise date will be issued by Planning thru the repromise procedure which follows.

B. Repromises On Previously Received Orders

1. When Issued

Repromises will be issued:

- a. When items originally marked "to advise" are placed on the production schedule. As indicated in Section "A", the date will be definite if scheduled for production within one week, and tentative otherwise.
- b. When Thursday of the week preceding the scheduled week for production of a tentatively promised item is reached. (See Section A, paragraph 1-a-2 above) At this time a definite date is given.
- c. Whenever changes occur affecting items on which definite promise dates have been assigned. (i.e. Items to be produced within the next week)

2. How Issued

Repromises will be entered on the daily "Opalon-Ultron Repromise Report" form (see sample attached). This report will be prepared in three copies and distributed as follows:

Sales Correspondent
Shipping Foreman
Planning File (to be routed through the Operating
Superintendent and Area Supervisor)

The Sales Correspondent's copy will be delivered by special messenger by 3:30 PM each day.

3. Telephoned Repromises

If the repromise affects an item scheduled for shipment on the current day, the new date will be transmitted immediately to the Sales Correspondent by telephone. This will be confirmed later by a written entry on the daily repromise report.

C. Monthly Repromise Report

The Planning Group will prepare a monthly summary of the number of repromises issued, classified according to reason, for the in-

formation of Production, Order, and Sales Department supervision in order that undesirable trends may be high-lighted and corrected.

D. Notification of Shipping or Production Delays

If the above procedure is to be effective in keeping all those concerned informed on order status, it is essential that the Planning Group be notified immediately by Shipping and by Production of any conditions arising in those areas which will affect in any way the schedules or promises issued by Planning. Specifically, it will be Shipping's responsibility to notify Planning as soon as possible, and by 3:00 PM at the latest, of any scheduled shipments which are to be delayed. Likewise, Production must notify Planning of any failures to meet production schedules as soon as the facts become known. This includes notification of the date and duration of all trial runs as soon as this information is available.

... ..

RSV0026893



APPENDIX C

PROCEDURE BULLETIN FOR TRANSFERS TO BONDSVILLE
AND TO PUBLIC WAREHOUSES

This bulletin is still in process of preparation and
will be issued upon completion.



APPENDIX "B"

ULTRON FILM

I.B.M. CODE FOR "SUB-STANDARD 1286" MATERIAL

1. Cold Marks
 2. Veneer
 3. Fisheyes
 4. Contamination
 5. Pucker
 6. Pick off
 7. Color Streaks
 8. Off Color
 9. Orange Peel
 10. Wrinkles
 11. Gloss
 12. Matte
 13. Non-standard Formulation
 14. Non-standard yield.
-
50. Check before shipping.



ULTRON COMPOUND OR PREMIX - OPEN ORDER STATUS

INVENTORY CODE 1284 SAMPLE FORMULATION NO. 1018 COLOR RED

ORDER ENTERED		CUSTOMER NAME	OUR ORDER NO.	LBS. ORIGINAL ORDER	SHIPMENTS						TOTAL LBS.	NET LBS.	REMARKS
DATE	TIME				DATE	LBS.	DATE	LBS.	DATE	LBS.	SHIPPED TODAY	OPEN ORDERS	
1953		Columbia Cable	W1124	10,000	4/17	3850					3850	6150	4/30
4/13													

RSV0026899

APPENDIX E - Pg. 1

FILM
 ULTRON COMPOUND OR PREMIX - OPEN ORDER STATUS

INVENTORY CODE White SAMPLE FORMULATION NO. 4 COLOR 4001 .005J 55 2.6

ORDER ENTERED		CUSTOMER NAME	OUR ORDER NO.	LBS. ORIGINAL ORDER	SHIPMENTS						TOTAL LBS.	NET LBS.	REMARKS
DATE	TIME				DATE	LBS.	DATE	LBS.	DATE	LBS.	SHIPPED TODAY	OPEN ORDERS	
1952													Inventory
9/22		Jason	U1765	7160								7160	H.F.C.R. 8040

RSV0026900



SUMMARY LIST OF COSTS OF
PRODUCTION CHANGES

<u>Description</u>	<u>Code No.</u>	<u>Loss</u>	<u>Cost at \$80.00 per Hour</u>
1. Color Changes:			
a. Minor Change	1	100 lbs. due Gross contam.	\$ 10.00
b. Minor Cleanout	2	2 hours	160.00
c. Major Cleanout	3	20 hours	1600.00
2. Formulation Changes:			
a. Within Range	4	22.5 mins.	30.00
b. Between Ranges	5	2 hours	160.00
3. Gage Changes:			
a. Within Range	6	30 mins.	40.00
b. Between Ranges	7	1 hour	80.00
4. Width Changes: (All)	8	7.5 mins.	10.00
5. Embossing Changes:			
a. Plain to Embossed	9	20 mins.	40.00
b. Embossed to Plain		1.5 mins.	10.00



**SUMMARY OF
MAJOR PRODUCTION COUNTS & STANDARDS**

Cod No.	Description of Major Count	Principal Appraisal	Source of the Monthly Figure or Control Report	Pattern Qty./No.	Std. Unit Time		Total Std. Time Bas'd on Pattern
					Hours	Per	
1	Total Orders & Releases received	Orders	Phone Order Dept. (Mr. Parmerleau)	200	0.04880	Unit	9.759
2	Total Instructions & TT No Charges Received	"	" " " "	100	0.01440	Unit	1.440
3	Total No. of Product items shipped.	"	Count items on Daily Lists of shipments & add for total.	470	0.05330	Unit	25.020
4	Pounds of Compound & D.B. Produced	Production	Month end Accounting Report	1,150,000	0.01460	1000	16.813
5	Pounds of Resin Packed Out in Bags	"	Total of Daily Produc- tion Summaries	2,150,000	0.00700	1000	16.010
6	Number of Different Film Items Produced	"	Count items on Produc- tion Schedule	45	0.22530	Unit	10.135
7	Rolls of Film Shipped (including drums) & Transferred	Shipments	Add up each day on Daily reports and total for month.	3,000	0.00660	Unit	19.800
8	Pounds of Compound & D.B. Shipped and Transferred	"	Month end Accounting Re- port plus total of trans- fers from Daily Shipping Report.	1,047,000	0.00840	1000	8.795
9	Pounds of Resin Shipped & Transferred	"	" " " "	3,100,000	0.01120	1000	34.720

Summary of Major Production Counts & Standards

APPENDIX G - Pg. 2

Code No.	Description of Major Count	Principal Application	Source of the Monthly Figure for the Control Report	Pattern Qty./No.	Std. Unit Time		Total Std. Time Based on Pattern
					Hours	Per	
10	Total Pounds of Film, Compound, and D. E. Produced	Raw Material	Month end Accounting Report (= Item 4 & Film)	1,550,000	0.01960	1000	30.380
11	Number of Compound and D.E. Items Produced	Production Schedules	Count lines used in Blend Book for the month.	30	0.08400	Unit	2.520
12	Total TT's received	Orders	Total of Counts 1 & 2 above.	300	0.01630	Unit	4.890
13	Number of Formulations on Monthly Production Schedules	R.M. Forecast	Count on Work Sheets for Film & Compound Material Forecasts	16	0.59000	Unit	9.433
Total Measured Work -							189.615
Total Std. Hours Related to Total Measured Work - 0.11100 Hour							21.055
Total Constant Work - 16.40000 Month							16.400
Grand Total Standard Hours							227.070



MONSANTO CHEMICAL COMPANY

MONTHLY JOB SUMMARY OF STANDARD HOURS

Department

Pattern Month

Date

POSITIONS AND FUNCTIONS	BASIS OF MEASUREMENT	STANDARD UNIT TIME	ACTUAL MONTHLY UNITS	STANDARD MAN HOURS	ACTUAL MAN HOURS	OVER (RED) OR UNDER STANDARD	PERCENT OF EFFICIENCY
Production of U.S. compound		0.01880	200	9.760			
Production of U.S. compound		0.01880	100	1.440			
Production of U.S. compound		0.05330	470	25.050			
Production of U.S. compound		0.01880	1,150	16.790			
Production of U.S. compound		0.01880	2,150	15.050			
Production of U.S. compound		0.01880	45	10.139			
Production of U.S. compound		0.01880	3,000	19.800			
Production of U.S. compound		0.01880	1,047	8.795			
Production of U.S. compound		0.01880	3,100	34.720			
Production of U.S. compound		0.01880	1,550	30.380			
Production of U.S. compound		0.01880	30	2.520			
Production of U.S. compound		0.01880	300	4.890			
Production of U.S. compound		0.01880	16	9.440			
Production of U.S. compound				188.774			
Production of U.S. compound		0.01880		21.055			
Production of U.S. compound		16.400		16.400			
Production of U.S. compound				226.229	203.20	+23.029	111.1

VINYL PLANNING GROUP

Office Performance Report For Month Of PATTERN MONTH

		HOURS	AMOUNT
1. Hours Paid For: (Average straight time hourly rate \$)		—	—
A. Regular hours at straight time rate		172.00	
B. Overtime hours at straight time rate			
C. Overtime premium amount		—	
D. Borrowed service (add male clerks plus work not done)		20.00	
E. Loaned service (deduct-red)			
F.			
G.			
H.			
I.			
TOTAL		203.20	
2. Less Adjustments For:		—	—
A. Vacations			
B. Illness			
C. Holidays			
D. Excused or other absence			
E. Overtime premium amount		—	
F.			
G.			
H.			
I.			
TOTAL		0.00	
3. Net Available Hours (Item 1 less item 2)		203.20	
4. Standard Hours (From job summary of standard hours)		226.220	
5. Variance From Standard (Item 3 less item 4-loss in red)		-23.020	
6. Operating Efficiency (Item 4 divided by item 3)		111.3	%
	CLERICAL		
	MEASURED	UNMEASURED	SUPERVISION
7. Number Of Personnel	1	2	3
8. Comments			
This item is composed of the following: Position 3 (Clerical) work done by unmeasured male clerks 19.69 hrs. Operations included in pattern workload, but not actually done during the analysis period: Reproduce procedure 6.88 Filing lab reports 0.63 Monthly Control report 3.02 Total 10.53			
Date Of Survey			

MONTHLY JOB SUMMARY OF STANDARD HOURS

..... MONSANTO CHEMICAL COMPANY GROUP

MARCH, 1953

Department

Date

POSITIONS AND FUNCTIONS	BASIS OF MEASUREMENT	STANDARD UNIT TIME	ACTUAL MONTHLY UNITS	STANDARD MAN HOURS	ACTUAL MAN HOURS	OVER (RED) OR UNDER STANDARD	PERCENT OF EFFICIENCY
1. Total production of releases		0.01880	243	11.858			
2. Total production of IT No Charges		0.01880	115	1.656			
3. Total number of product items shipped		0.05330	303	16.150			
4. Number of items produced and D. B. produced		0.01460	826	12.060			
5. Number of units packed out to bags		0.00700	2,505	17.535			
6. Number of different film items produced		0.22530	28	6.308			
7. Number of film shipped and transferred		0.00660	1,793	11.834			
8. Number of film produced and D. B. shipped & transferred		0.00880	932	7.829			
9. Number of units shipped and transferred		0.01120	2,892	32.390			
10. Total number of film, compound, and D.B. produced		0.01960	948	18.581			
11. Number of compound and D.B. items produced		0.08400	21	1.764			
12. Total production: released		0.01630	358	5.835			
13. Number of formations on monthly production		0.59000	13	7.670			
A. Total Measured Work				151.470			
B. Work Related to Measured Work				0.11154	16.895		
C. Constant Work				16.400			
D. Total Department Performance				184.765	193.50	8.735	95.5

VINYL PLANNING GROUP

Office Performance Report For Month Of MARCH, 1953.

		HOURS	AMOUNT
1. Hours Paid For: (Average straight time hourly rate \$)		—	—
A. Regular hours at straight time rate		174.50	
B. Overtime hours at straight time rate			
C. Overtime premium amount		—	
D. Borrowed service (add)		26.50	
E. Loaned service (deduct-red)			
F.			
G.			
H.			
I.			
TOTAL		201.50	
2. Less Adjustments For:		—	—
A. Vacations			
B. Illness		8.00	
C. Holidays			
D. Excused or other absence			
E. Overtime premium amount		—	
F.			
G.			
H.			
I.			
TOTAL		8.00	
3. Net Available Hours (Item 1 less item 2)		193.50	
4. Standard Hours (From job summary of standard hours)		184.76	
5. Variance From Standard (Item 3 less item 4-loss in red)		8.75	
6. Operating Efficiency (Item 4 divided by item 3)		95.4	%
	CLERICAL		
	MEASURED UNMEASURED	SUPERVISION	TOTAL
7. Number Of Personnel	1 2	4-5-6	3
8. Comments			
*Composed of:			
Clerical work done by male clerks		15.00	
Work included in standard hours, but not actually done		10.50	
TOTAL		25.50	
Date Of Survey			



APPENDIX I

ULTRON FILM

PRODUCTION SCHEDULING GUIDE

The need for a systematic method of evaluating film production sequences and the attendant change-over costs has long been felt. The following procedure is the result of an attempt to develop such a system which can be readily and simply applied to desired schedules in order to determine the change-over costs involved for comparison with established cost standards.

The first step in development of this procedure was to simplify the classification of the change-overs on the calender as listed in Appendix F. This was done on the basis of cost per change as shown in the following table:

Classification of Calender Change-Overs

<u>Change Code Number</u>	<u>Types of Change Included in Classi- fication Code</u>	<u>Unit Cost of Change @ \$80/Hr.</u>
1	Minor Color Change Width Change Embossed to Plain	\$10.00
2	Formulation Change - Within Range	30.00
3	Gage Change - Within Range Plain to Embossed	40.00
4	Gage Change - Between Ranges	80.00
5	Minor Color Clean-out Formulation Change-Between Ranges	160.00
6	Major Color Clean-out	1600.00

To determine the approximate order of magnitude of possible savings in this regard, an analysis of the first quarter production schedules for 1953 was made. These schedules were evaluated in two ways, based on the above table of costs: First, the total cost of changes was determined assuming that the originally scheduled sequence had been followed; and, second, the total cost of changes for the actual sequence of production was derived in the same manner. The difference between the two represented, of course, the additional cost involved as a result of deviations from the original schedule. The results of this analysis are summarized below:

Cost of Film Schedule Changes

First Quarter 1953

	Total Cost of Changes at \$80.00 Per Hour	Change Cost Per Pound Produced (674,500 pounds)
Actual Sequence	\$5,980.00	\$0.0089
Originally Scheduled Sequence	3,460.00	0.0051
Loss Due to Deviations from Original Schedule	2,520.00	0.0038

The standard cost allowance for changes which has been established for Accounting purposes is 5% of the operating hours. Computing this in terms of dollars, assuming capacity production and \$80.00 cost per hour, we get:

Standard Cost of Changes = \$0.0042 per lb. produced.

Comparison of this figure with the current change cost of \$0.0089 per pound shown above indicates that changes are presently running at slightly more than double the allowed standard.

The attached form for "Weekly Production Schedule Evaluation" has been developed as a means for ready evaluation of proposed schedules in terms of change cost per pound. This form will be completed by Planning and approved by Production Supervision on each Thursday prior to "freezing" of the production schedule as described in Section IV-1-d of this manual. All proposed schedule revisions will likewise be evaluated in the same manner.

By use of the data contained on this form, production schedules involving high change-over costs will be high-lighted and improvements may possibly be negotiated with the Sales Department. Furthermore, the accumulation of such data will give an accurate indication of the trend of change-over costs so that appropriate corrective action may be initiated when deemed necessary. A third benefit to be derived is in the use of this data by Production for the explanation of cost variances.

