CABLE CONNECTING DOCUMENTS, METHOD OF USE (CCD SYSTEM)

CONTENTS

Graphic Reproduction Section GR 8.1 Required

1. GENERAL

1.1 Scope of Section

1.1.1 This section presents a suggested method of using Cable Connecting Documents (CCD). It also includes new instructions on the use of the ABRIDGED version.

1.2 General Information

1.2.1 The formats used for CCD are described in Section 8.

1.2.2 The CCD has been developed to substantially reduce the analysis effort for all systems, and consolidate all termination information into one package, tailored to the specific order upon which the cabling and wiring operations are being performed. Old CCED Documents are not being maintained for the systems producing CCD Sheets and should not be used. Reference to CCEDs in SWF Titles pertaining only to connecting documents of other systems on runs that cross system boundaries.

1.2.3 Since job conditions vary greatly, no attempt has been made to provide specific details for each system. Thus, the following methods are general, and will not refer specifically to any system. It should be noted that in Crossbar 5 System, the preanalysis work in completed by the regional CCA, Cable Connecting Analysis, group. The SWF(s) Standard Wiring Format included in this system (printed by the computer) can be used directly in connecting of leads. Those SWF(s) requiring additional analysis will be identified on the Cover Sheet.

1.2.4 At the completion of the installation the CCD sheets with the book holders shall be disposed of.

2. PRELIMINARY STEPS

2.1 The CCD Documents are printed on 8-7/8 X 14 special paper (SD-97-1800 or SD-97-1801) striped with background color for easy line identification. Variations to this are occurring at different regional centers depending on printing facilities available. These will be shipped in boxes or envelopes to job site completely assembled into books with blue R-4629 Book Holder fastened with nylon ties. Box or boxes of CCD output are identifiable from other containers by markings on cartons. If CCDs are not assembled or are not on job site before the job start date, contact your Field Service Organization at the Region.

2.1.1 If more than one carton is sent to job site the first carton should contain the Manifest (4 copies provided for all systems except Crossbar 5 which will have only 3 copies) followed by the Error Report, Job Processing Statistics, Installers's Cross Reference Listing and SWF Multi Use Cross Reference Listing (ABRIDGED ONLY). Use the Manifest as a packing list to verify the receipts of all the CCD books.

A. Late specs will produce a separate output, the same as your cable tags.

B. Every frame, being cabled "to" or "from", is listed on the Manifest.

C. Every cable or wire listed in the "C" section of cabling spec will be shown on the CCD output.

D. Every cable tag will match an output on the CCD Systems.

2.1.2 Books for one frame or location may be referred to on the Manifest by several names (e.g., FB 101.1, FB 101.1 (24V Sig), FB 101.1 (48V Sig), etc.,). Originated from the cable running list, a separate book will be generated by the computer for each name,

These separate books should be consolidated into on volume.

2.1.3 OCFs on two-part NCR paper provided by some Regional Centers are not assembled in books, but are loose. Only after analysis is completed should the pin-feed be removed and the sheets separated. Normally all pin feeds are removed by the Regional Data Center; however, removing pin-feed before analyzation is completed destroys the purpose of the NCR paper.

2.1.4 The nylon ties furnished with the books are releasable as shown in Figure 1. To prevent sheet tear-out, refrain from pulling nylon-tie too tight. Make sure book is slightly open to allow paper to flip over. If for some reason additional ties are required, the standard gray R-4265 ties may be used; however, these are not releasable and will require cutting to remove for any adjustment to the book. SD-48-125 to -127 Blank Forms may be used for detail area where space is not available on some OCFs or for use with the ABRIDGED Version of the SWF(s) requiring analyzation.

3. APPENDICES

3.1 Cabling Specs and Appendices numbers included with initial CCD package are shown at the end of the Manifest and Error Report.

3.2 Appendices cables included in initial CCD package.

3.2.1 Cabling changes are automatically inserted by the computer and all "delete" cables specified in an appendix are excluded from the CCD output.

3.3 Appendix numbers not included in initial package

3.3.1 Those cables associated with an appendix not included in initial CCD package will arrive on the job site in a separate CCD package. The following immediate action should be taken to prevent duplicate effort.

3.3.2 Manually separate the appendix CCD package and insert Manifest, Cover, SWF, and OCF sheets in proper sequence with initial CCD.

3.3.3 Refer to the "C" section of the appendix for cables designated "delete" and remove or cross-out these cables in the initial CCD package. Removing cables will affect the Cover sheets, SWF, or OCF on both ends and the Manifest.

4. ERROR REPORT

4.1 On all CCD outputs received, an Error Report will appear behind the Manifest sheets. The Error Report will indicate type of error found by the computer. (See Section 8 for explanation of error messages.) Since the computer still prints the SWF specified by the Engineer, avoid using these affected documents for analysis or wiring until new CCD sheets arrive or the Engineer informs you that they are still valid.

4.2 A copy of the same Error Report is sent to the Regional Engineer. It will be the Engineer's responsibility to send to job site new CCD sheets to replace those indicated as errors on the report. The new replacement sheets will be printed on two part NCR paper, one for each end of the cable. Insert the proper sheet in the appropriate books. Check cover sheet of these books and correct the necessary information associated with the run number involved. Corrected SWF's will also have an Error Report. These are also corrected by the Engineer and then sent.

4.3 SWF Error Check

4.3.1 Besides the Error Checks completed by the computer, a very important check should be made before using or analyzing an SWF document. In the header of an SWF, compare the third and fourth line. This is the, "TO and FROM" frame or equipment location. The third line is retrieved from the data base, and the fourth line is the same as information shown in the "C" section of the cabling specification. although they may not be printed the same (one may be abbreviated), the third and fourth line should match. If they don't match and it indicates a foreign location or equipment on the third line, the SWF furnished for this run is wrong. Contact your Regional Engineering Organization and ask for the correct SWF document. This will be furnished on a request mode and should be received within a few days. (Future programming changes will eliminate the need for this verification.)

5. REQUEST MODE APPLICATION

The request mode function provides an SWF output printed on two-part NCR paper on an individual cable basis. A particular SWF may be requested through the Regional Engineer. Also those replacement sheets associated with the error report are ordered by the Engineer on a request mode.

5.1 These sheets when received are to be inserted into the original CCD package. The old sheets, if there are any, should be removed and discarded. New sheets may affect the information on the Cover sheet and steps should be taken to mark the Cover sheet when required.

6. FEATURES AND INDICATORS

6.1 Manifest

6.1.1 The total number of cables and wire ends has been provided on the Manifest for each frame as an aid for estimating and scheduling manpower.

6.1.2 Space has been provided on the Manifest for recording wiring progress, and individual work assignments.

6.1.3 When corresponding on any omissions or errors in this output the print tape listed at the bottom should be specified e.g., "PRINTED FROM TAPE(S) RPD 14.CE16. PROD PRT.G0216V00"

6.2 Job Processing Statistics

6.2.1 Should there be errors or omissions this sheet or copy of this sheet should be attached to JIM(s) or other corespondance.

6.2.2 To determine if the output received is the ABRIDGED version the 8th line should read SWFs ABRIDGED TO H=(nbr)

6.3 Cover Sheet

6.3.1 An indication of the degree of analysis for each cable is provided in the NT column of the cover sheet. the indicators can be used as a basis for assigning analysis and wiring operations to specific individuals.

6.3.2 A blank in the NT column, associated with SWF(s), indicates that no analysis is required on either end of the cable. Specific terminations have been assigned by the computer.

6.3.3 A single asterisk (*) in the NT column, indicates minor analysis required. All the information required for termination has been provided on the SWF sheet and reference to standard drawings is unnecessary. An experienced installer can wire directly from the information provided, thus analysis effort is not required.

6.3.4 A double asterisk (**) in the NT column, associated with SWF(s), indicates major analysis requiring an experienced analyst to obtain information from other standard drawings.

6.3.5 A pound sign (#), a question mark (?) or an alpha (N) appearing in NT column indicates complete analysis is required on these OCF(s). Since only the heading and color of the cable ordered is printed, the analysis may be complex. These sheets should be assigned to an experienced analyst.

6.3.6 When #'s symbol appears in NT column the output for that cable is suppressed. No SWF(s) or OCF(s) are provided. This will necessitate using blank forms SD-48-125 to -127 or plain paper to complete connecting data.

6.3.7 E1 Error Message (appears only on COVER SHEET and OCF) E1 OCF UNKNOWN - Indicates that the system cannot identify the RM arbitrary number shown in the "C" Section of the Cable Running List. Cable or wire codes will be missing in the column designated "COLOR." When doing the analysis of this OCF, cross-reference information for the arbitrary RM number can be obtained from the last few pages of the "C" Section. Using this information the OCF should be completed by specifying the associated colors as necessary.

7. ANALYSIS

7.1 As previously mentioned, a separate book has been generated for each frame or work location. Terminating information on the left hand side of the blue sheet printed on SD-97-1800 pertains only to the frame at which the terminations are being made. The terminating information on the right hand side of the sheet pertains to the far end of the cable. Therefore, it is unnecessary to enter terminating information on the right hand side of the sheet. The book for the far end of the cable will contain the terminating information on its left hand side. Where analysis is required, it is advisable to enter the necessary information on the appropriate sheets from both books at the same time as further described in Paragraph 7.2 (making entries only on the left hand side).

7.2 On the Cover Sheet a space is provided adjacent to the "T" and "F" indicators for initials or a check mark to indicate completion of analysis work for that cable. When analyzing, start with book one and the first "F" cable ("From" or originating end) as printed on the cover sheet. At the same time from the cover sheet obtain the book number for the termination of that cable. With both books open to the same cable any making required should be completed in each. If this practice is followed, eventually all "T" ends will be completed along with the "F" ends.

7.3 When two or more SWF or OCF sheets on the same frame are identical in the left hand column, it is not necessary to make complete entries on each sheet. One sheet should be completed, and the others can have the notation, "SEE Run # __, Page __".

7.3.1 The procedure described in paragraph 7.3 may also be used for identical termination information on nearby frames. Depending on the number of installers wiring may govern the amount of duplication required.

7.3.2 An Installer's Cross Reference Listing sheet provides a numerical list of all cables for that order and indicates the book numbers in which these cables can be found. Although this sheet is not necessarily needed in analysis if the layout is being performed on book by book method, it does save effort if it is necessary to know where a particular cable, shown in the cabling specs, is specified in the CCD books.

7.4 ABRIDGED CCD SYS

7.4.1 The ABRIDGED version of the CCD (Cable Connect Document) removes all duplicate appearances of SWF(s) (Standard Wiring Format). Unlike the analysis described above where all SWF data is found in the same book, the ABRIDGED system will only print the heading from the cabling spec after the first appearance. To find the first appearance will require obtaining various other books. Also, the convenience of having more than one sheet when several people are working will no longer be there, unless copes as needed are made

during the analysis function.

7.4.2 Using the ABRIDGED version requires using the Cover sheet and the SWF MULTI USE REFERENCE LISTING (SEE SECTION 8). Those cable runs that specify an SWF number will have the normal appearance in the book and should be used in accordance to paragraph 6.3. Those cable runs having the designation "H" in the SWF NUMBER column will only have the heading copied from the Switchboard Cabling Spec and a "?", indicating job information only, in the note column. In order to find the associated SWF (1st appearance) and to determine if analysis is required it will be necessary to refer to the SWF MULTI USE REFERENCE LISTING. The following steps should be followed:

STEP 1 - ON LISTING FIND RUN NBR OF CABLE MISSING DETAIL INFORMATION
STEP 2 - FOLLOW 'H' UP THE PAGE TO 1ST SWF NBR
STEP 3 - REMEMBER RUN NBR ASSOCIATED WITH SWF NBR
STEP 4 - CHOOSE BOOKS - "FROM" OR "TO" (ORIG END)(TERM END)
STEP 5 - OBTAIN CHOOSEN BOOK
STEP 6 - FIND ASSOCIATED RUN NBR ON COVER SHEET
STEP 7 - NOTE IF CABLE HAS A *(OR)** IDENTIFIER
STEP 8 - TURN TO PAGE SPECIFIED AND CONNECT FROM DETAILED PORTION. IF CABLE WAS MARKED WITH *(OR)** THEN ANALYSIS IS REQUIRED. XEROXING OR HAND COPYING MAYBE NECESSARY TO CUSTOMIZE TO JOB CONDITION.
FORMS SD-48-125, -126, -126B, -127, & -127A ARE ALSO AVAILABLE.

7.4.3 Avoid Problem Area

7.4.3.1 Unique Cable Designations
Only in the toll system each SWF has a different cable designation 99.9% of the time.

On other systems one cable designation could have several different numbered SWF(s), for example:

ESS product Line
VS 102 (ca desig) has 56 different SWF numbers
VS 103 (ca desig) has 36 different SWF numbers

On the Cover sheets for each book the SWF number appearing above each H grouping may not be the SWF number to use even through the cable designations are the same.

Use "SWF MULTI USE REFERENCE LISTING" for positive identification

When working on a frame another alternative to verify that connecting data used from another cable is correct is to compare SWF number of the connecting sheet with the one printed on the cable tag.

7.5 Those sheets received loose in two-part NCR must be inserted into proper books after analysis is completed. Remove pin feeds and separate the blue and green sheet. Refer to Figure 1 for methods of opening and closing books. Book holders may be marked with felt pen as required to help identify book number and associated frame.

7.6 When the analysis of all the cables in a book has been completed, the analyst should initial the cover sheet in the space provided.

7.7 SWFs and 710 Connectors

7.7.1 SWFs are being provided for standard designated cables that are ordered for splicing into existing cables or stub cables from reused equipment. The SWFs will provide the normal connecting data as if the new cable is hard wired at both ends. The splicing termination may be added to the SWF sheet during analysis; however, before assigning colors at the splice the stub or existing cable should be verified physically even tested to insure that the proper function of the lead agrees with the function of the new spliced lead. If color assignments turn out to be the same or after matching verification is accomplished, wires should be assigned at splice (connector) in order of the normal color sequence of a cable, if possible. Further instructions to the wireman are printed in Installation Engineering Handbook 9, Section 373.

7.8 On COSMIC tie cables, the detail area of the OCF worksheet is suppressed to reduce the number of sheets on cables that are repetitious in termination and color pattern. Along with the normal heading the words "ORDERED CABLE FORMAT SUPPRESSED FOR THIS RUN" will appear. When analyzing the run, it will be necessary to assign color pattern and termination for the first cable on a separate sheet of paper and attach to the CCD book. The Cover Sheet for that book, under these runs involved, will show a "#S" in note column. This symbol denotes OFC suppressed. In addition, a "S" symbol will appear in the SWF file number column on the "INSTALLER'S CROSS REFERENCE LISTING".

8. REPORTING CABLE CONNECTING SHEET DISCREPANCIES

8.1 The Installer shall report discrepancies by originating a Job Information Memorandum (JIM), Form SD-4-1007 and a CCD System or Cable Connecting Sheet Information Memorandum, Form SD-47-760 (or old Form SD-4-760) and forward to Regional Field Service Per CI 47.242. Group SWF requesting information under same JIM number and issue, starting with number (1) which shall be raised sequentially for each future request for SWF information. It is important to specify the order, run, cable spec, SWF numbers with the issue of the SWF and a copy of the JOB PROCESSING STATISTICS on any correspondence.

9. USE OF BOOKS AT WORK LOCATION

(See Figure 2)

9.1 The blue book holders furnished with ears at each side are assembled to CCD output using plastic ties by the Regional Distribution Organization. Normally, no assembly or reassembly is required unless the following occurs.

A. Job specs are late and are processed through SPC at different times resulting in two or more outputs for each frame. (This will require merging books on the job site.)

B. SWF(s) produced on a request mode will require manual insertion on job site in the proper frame book.

C. OCF(s) produced on two-part paper will require inserting each sheet in correct book after installation analysis is completed.

WARNING:	THESE HOLDERS ARE FURNISHED WITH ELECTRICALLY NONCONDUCTIVE PLASTIC TIES. DO NOT SUBSTITUTE WITH METAL FASTENERS.

10. CABLE VERIFICATION

10.1 The Cover Sheets are to be used to verify that all the cables have been run to the frame on the correct side prior to butting and stripping.

11. CONTINUITY TESTING

11.1 The SWF documents are to be used for continuity testing, utilizing the information printed by the computer. At the discretion and responsibility of the Installation Supervisor, the OCF sheets and other terminations manually added on the SWF, may also be used during continuity testing. On the ABRIDGED version, verification of Lead termination will function in the same way as when multiple appearances occur in each book. However, the restriction of having only one print-out for any number of frames may cause additional effort and inconvenience.

No arrow due to extensive changes.

Engineering Planning Manager
(Installation)

Reason for Reissue:
Reissued to include ABRIDGED version